

INDIAN INSTITUTE OF MANAGEMENT CALCUTTA

WORKING PAPER SERIES

Effect of Self Accountability on Self Regulatory behaviour - a Quasi Experiment

INTRODUCTION

Accountability to Whom: Others and/or Self

In the social set up people live in, decisions and actions do not exist in vacuum but affect others. Decision makers are answerable to people who are affected by these actions. This answerability is termed as decision makers' accountability and is a universal feature of natural decision environment (Tetlock, 1985). Frink & Klimoski (1998) defined accountability as "perceived need to justify or defend a decision or action to some audience(s) which has potential reward and sanctions power, and where such rewards and sanctions are perceived as contingent on accountability conditions" (p.9). Thus decision makers justify their decisions and actions to the 'audience' which evaluates them against some standards and expectations. These standards are determined by formal rules, or informal norms and values related to specific decision or action. While formal rules guide individuals' actions and decisions in many situations, it is impossible to frame rules for every conceivable situation even in relatively closed system like organization, leave aside broader social set up. In majority of situations in which individuals find.2449 Tw6.7(ic decisu9.1(xls)-4.8e)0.6(deleav483 -2.295) noted that in recent times accountability has been studied extensively in other fields like health, education, politics, but not much in psychology and management. Further, most of the studies in psychology stream have been laboratory studies which have limitations in terms of generalizability. In order to advance accountability research, there is a need to conduct more field studies.

Empirical research has shown both positive and negative effects of accountability on

preference which affects their judgment of morality of behaviour as well as behavioural intentions. They considered instrumental values in their experiment because, as opposed to the terminal values, these have clear behavioural guidance. Values have been shown to affect managerial decisions (England, 1975), and perceptions of business ethical dilemmas (McDonald & Gandz, 1991, 1992).

Individual's Moral Development Stage and Self Accountability

individuals feel more accountable internally while in first two stages they will feel more accountable externally.

Individual's Disposition, Demographics and Self Accountability

Certain personality traits like self monitoring, type A personality, internal locus of control, and Machiavellianism hold certain values dearer than others, and past studies (Chen, Shecter, & Chaiken, 1996; Hegarty & Sims, 1978; Perry, Kane, Bernesser, & Spicker, 1990) show empirical support for their effect on ethical decision making. For example self monitors, who have higher external locus of control, feel more accountable externally while those with internal locus will feel more accountable internally.

Demographics also influence one's value system and hence their self accountability. In organizational context, younger employees, with lesser work experience, and lower responsibility are more ethical than older employees with more responsibility, work experience and income (Roozen, 2001). This may indicate that younger lot is more self accountable. Similarly, females stereotypically have been found more ethical (Sims & Keenan, 1998) and may be more self accountable.

Social Norms and Self Accountability

One more major factor affecting one's values and beliefs (y)-6.69aoi.1(e)w[Sonla)1rn antht anSon s[S(th)-

illustrated the importance of creating awareness and building consensus. Outside such formal

appealing. Therefore, in the current research reduction of waste by an individual is a self regulatory effort when faced by a social norm. Felt accountability explains the cognition underlying the effect of norm on behaviour. Carver & Scheier (1982) argued that "directing attention to self, when a behavioural standard has been evoked by the nature of one's role or setting, engages the comparator at the level of control that is superordinate. The result is tendency to compare one's perceptions of one's present stae or behaviour against the standard, leading to a reduction of perceptible differences between the two" (p. 120).

However, in the current experiment, due to repetitive nature of stimulus in form of daily wastage data, the accountability cognition progressively influences individuals' behaviour. The control model of self regulation (Carver & Scheier, 1982) provides appropriate explanation of this progressive behaviour. According to this theory, the basic unit of cybernetic control is the negative feedback loop, which effects the reduction between present condition and the reference value. And it is cyclic achieving progressively closer outputs to the reference value. Therefore it is hypothesized that,

Hypothesis1. In the absence of external accountability conditions, individual's self accountability contingency will regulate individual's behaviour.

Before we discuss the study design, it needs to be mentioned that we have considered a deontological view of values, ethics, and self accountability i.e. individuals hold certain values and ethics irrespective of their consequences or in other words a worldview of "virtue as its own reward" (Turillo, Folger, Lavelle, Umphress, & Gee, 2002). This view maintains that an action's morality is independent of its consequences e.g. criteria of good for maximum populace. Behaviour is assessed for ethicality by examining the rules and principles which guide such behaviour. Thus we have not discussed certain important variables which take into account the consequences of behaviour, and which have been shown to affect ethical decision making. One example is moral intensity of issue. We have considered, social consensus, one component of moral intensity, but have not considered other components – magnitude of consequences for victims (or beneficiaries), probability of effect (probability of action and its detection by others), proximity with victims (or beneficiaries), and temporal immediacy of consequences (Jones, 1991). Our method ensures that consequences and above factors are not salient for individual decision.

METHOD

Procedure & design

A naturally occurring quasi experiment afforded an opportunity to study the hypothesized effect. In a management institute situated in Western India, 550 students stay inside the campus and take their meals in the institute mess. Meals are served four timesbreak fast, lunch, evening tea with snacks, and dinner. Meals are served in buffet style and students are free to take as much as they like in their plates or help themselves with as many servings as they like. Mess management noticed that students often leave huge amounts of eatable meals in their plates apart from leftovers like banana and egg peals. Interestingly, the wastage increases considerably whenever there is a special meal on offering e.g. on Fridays. This wastage not only causes considerable loss to the mess contractor and institute, but also caused problems in washing and disposing off the waste. In order to improve the disposal system as well as monitor and measure this wastage, the mess committee placed a waste basket in the mess and instructed students to just throw off the leftovers in it. Later on they placed this basket on a weighing scale so that each individual can notice how much he/she is adding to the waste. Also mess people started displaying day's total and mealwise waste

academic ethical conduct) at the institute, and this factor may also help in nullifying individual differences.

The sample constituted 12 % female students, the average age was 26.5 years with minimum and maximum of 22 and 32 years respectively.

Manipulation Check Method

In order to check whether intervention had the intended effect, subjects were asked to fill up a short online questionnaire after the experiment (see appendix A for questionnaire). It contained five items to check whether introduction of the weighing scale had any cognitive and behavioural effect on mess members' food wastage habits. It also checked whether removal of weighing scale reversed this effect. All but two items were measured on 6 point scale ranging from strongly agree to strongly disagree. The questionnaire is provided at annexure.

This questionnaire was displayed on two mess announcement notice boards on the

the mess at the beginning of every month. Due to limitations of resources, it was not possible to physically check how many persons ate during every meal. But it is a safe assumption because nature of MBA programme demands that students stay on the campus when their term is going on. But then there are other known and random factors which influenced the wastage data. Before making statistical inference from the data, we have tried to remove the effects of these fluctuations to smoothen the trend.

Events. During the period of investigation certain events took place in the institute which brought additional persons from outside eating in the mess for a period of 3-4 days at a stretch. These events included Chaos during , Confluence during, and Amaethon during . We have dropped data for first two events, because there was no way to know how many persons were eating in the mess during these events. In any case these included considerably large number of additional persons eating in the mess, and since these were not part of the intervention, it is suitable to drop these days from analysis. For last event since the numbers were lesser, we have taken an informed estimate for number of additional persons eating during the event.

Term off. Whenever the term ended for MBA students, they had a week off and most of them travelled to their home towns. During these days, we deducted numbers equal to batch size from the total persons enrolled at the starting of month. Additionally we cross checked with mess records the number of 'mess opt out' forms filled up by such students for February first week, 25 students were away from campus as part of ERI course conducted outdoors, and during February 12- 18th, 30 students went out of campus as a part of 'khoj' team for a period of ten days. These numbers were accounted for in the calculations.

Other programmes. Apart from MBA programmes mess also catered to the students enrolled in other course. These students were also present on the campus for most of the period during the course of intervention. These include 30 members of faculty development programme who stayed in the campus during a period of 3 months from. Then there were 60 members of the management programme for defence officers who regularly ate in the mess for a period of 6 months from . Additionally, there are around 35 fellow programme in management (FPM) students who were also regular members of the mess during this period. These numbers were taken into account, and term breaks, wherever applicable, were also accounted for in the calculations.

Specific events. Lastly, there are certain events, in which the members were involved, and which has affected the figures. It is difficult to put exact numbers to such events, but while making inferences and explaining the trends these have been take into account. These included summer placement for first year MBA students during , and pre-placement talks for second year MBA students in the month of February. The latter events mostly took place in the evening and involved students ranging from 40 -60 members who more often than not skipped dinner if they had snacks during such talks.

Focus on dinner data only. We are presenting data for all meals- lunch, dinner, breakfast, and high tea. Data for last two meals has been included in the total meal wastage figure and not shown separately. Looking at the data we did n't consider appropriate to analyse these two meals separately because they represented 25 % of the total daily wastage and had lot of random noise due to number of factors. Many students randomly skipped break fast or ate it quickly because they had to attend classes in the morning and given the late night

working habits at the institute many struggled to reach classes in the morning. Also we noticed that during high tea students visited mess randomly to eat snacks. On the other hand dinner alone accounted for 42 % wastage and lunch accounted for 33 %. We focus on dinner only because again in case of lunch there is much more random noise which is difficult to account for. For example, MBA first year students undergo unannounced quizzes 2-3 times a week just after lunch time and these are announced just before lunch. Students are not only anxious, but many tend to skip lunch. Then there are other visitors during working hours who visit mess for lunch on cash payment basis. On the other hand during dinner students are relaxed, there are practically no visitors, and thus the data is more valid representation of the phenomenon under study. Additionally, special meals are prepared mostly in dinners, and which are important for study because these show large wastage figures. Even then a comparison of three figures reveals that overall trends are similar for all meals. Thus inferences for dinner can be extended to other meals as well.

Actual and moving average plots. In order to smoothen the trend we are using moving average data in conjunction with actual data for inference. Each figure shows two plots- one enumerating the actual wastage and the other showing weekly moving average. We used weekly moving average because many activities related to mess happened over a cycle of week. For example menu repeated (not exact replication) over a week's time, e.g. every Monday, Wednesday, and Friday menu included non-vegetarian dishes. Then the MBA and other students had their term off for a period of week.

Initially we also wanted to account for people's preferences for certain menus over others as well as preparations, but because menus were hardly replicated exactly, it was difficult to get this data. Still we studied wastage data in conjunction with meals menu to get better insights. In any case it only caused fluctuations in daily data, but the overall trends have been unmistakable (refer figures 2, 3, and 4).

RESULTS

Wastage trends in Phase 1: Weighing Scale in Place

In figures 2, 3, and 4, series 1 corresponds to the phase 1 of the study, i.e. when weighing scale was placed below waste basket for 105 days between August 9th and 21st November. The three figures respectively represent trends recorded for the total wastage per person data, dinner wastage per person data, and lunch wastage per person data. A visual check on wastage trends for series 1, especially the weekly moving average, across three figures reveals a close match in the wastage data trends. Although actual data fluctuations

Insert Figures 2, 3, & 4 about here

Wastage trends in Phase2: Weighing Scale Removed

In figures 2, 3, and 4, series 2 corresponds to the phase 2 of the study, i.e. when weighing scale was removed below the waste basket for 71 days between November 22^{nd} and 31^{st}

incorporate distinct possibilities, three distinct models, as suggested by Gujarati (2003), were tested. These are given below:

Model 1: yt = + yt-1 + 2t +Model 2: yt = + yt-1 +Model 3: yt = yt-1 + 2t +

The null hypothesis is =0, i.e. there is a unit root, and series is non-stationary. According to **Dickey-Fuller** test statistic, if t value for is $> t_{cr}$ (=), then null hypothesis is rejected and series is stationary. All three models show stationary properties based on **Dickey-Fuller** test statistics given in table1.

Insert table 1 about here

In the next step, we plotted correlograms for autocorrelation function (ACF) and partial autocorrelation function (PACF) of y_t . These plots are shown in figure 5. It is evident from these plots that y_t is influenced by y_{t-2} and y_{t-7}

Based on the D-F test, we conclude that series 2 is stationary, except when tested on model 3, which in any case does not match the specified time series model in equation 1.

In the next step, we plotted correlograms for autocorrelation function (ACF) and partial autocorrelation function (PACF) related to y_t . These plots are shown in figure 7. For series 2, the first, second and seventh lag values are not that influential as e.g. 5th or 10th lag values. However, none of the lag effects fall outside the 95% confidence interval. And theoretically the logic of 1st, 2nd, and 7th lag effects still apply in case of series 2. Therefore we regressed yt for series 2 as per equation 1. The model explained insignificant proportion of variance in yt with R^2_{adj} = .07 (F= 2.18; p=0.082). The ACF and PACF plots for studentized residuals (fig 8) fell almost within the 95% confidence interval, thereby proving that the model specification is adequate.

Insert table 4 and figure 7 about here

None of the independent variables emerged significant¹. The lag effect signs were also inconsistent with the expectations. For example, we expected positive signs for both yt-2 and yt-7, and negative for yt-1. This inconsistency is also reflected in the ACF and PACF plots for the two series. While for series 1, the first seven lag effects in ACF plot consistently fell on one side of the mean line, for series 2 these fell on both sides for series 2. As expected, time or date showed a positive effect, thereby confirming the reversal of series 1 trend of falling wastage figures. Thus we can infer that, after removal of weighing scale, the wastage data again started increasing. It is also evident from the progressively increasing amplitude of

¹ Based on ACF and PACF plots for dinner wastage figures for series2, yt-5 and yt-10 also seem to have influence on yt. Though there seems no logic for these effects, we included these lags also in eq 1 and ran regression again. Except that it improved R^2_{adj} to 17%, and ACF and PACF plots for residuals fell within 95% limits, time (t) remained insignificant but in positive direction.

variation in wastage data in case of series 2. It again revealed a reversal of trend observed in series 1 wherein the variation in wastage figures steadily fell after large initial variations. These trends are visible in the ACF and PACF plots for two series in figures 5 and 7.

Manipulation check results

As discussed in the method section, effect of weighing scale on students' response was checked using five items. Data (panel 1) shows that out of 54 respondents, more than 70% felt that placement of weighing scale did make them conscious about the waste they are adding. And they also agreed that it is the main reason for waste reduction. Almost 80% of respondents felt that after removal of weighing scale they have stopped noticing the total waste figures displayed on the board. Although they disagreed that they have stopped noticing the meals they waste in their plates. They also agreed that scale did have major impact on altering the wastage habits of the students. Almost 65% respondents replied that they did notice the removal of scale, and 60% noticed it in month of December.

Insert Panel 1 about here

Therefore, it can be inferred that placement of the scale did have the intended impact, and the waste trends and time series results are not spurious.

DISCUSSION

Evidence in support of hypothesis

The overall wastage data trends, wastage data variation trends, and time series analysis for the two series provide support for the hypothesis. When the weighing scale was in place, the moving average wastage data progressively reduced from 40gm/person to 15 gm/ person. After removal of weighing scale, it again increased to around 30gm/person. Corresponding figures for reduction of total wastage were 80gm/person initially to 40gm/person, and again an increase to 70gm/person. The time series analyses confirm these trends. After controlling for lag effects, for phas

changed behaviour did n't persist as habit in series 2. The respondents of online survey also informed that majority of them have stopped noticing the cumulative waste figure displayed on the board in post test phase. It implies that the weighing scale functioned as an individual stimulus which made students conscious or self accountable, making them more observant about the wastage data as well as how large helpings they take and waste. Once the stimulus is removed the students seem to go back to earlier careless food eating practices, less observant of their food intake and waste behaviours. However, majority of them denied that they have stopped observing the amount of wastage in their own plates.

Limitations

The pretest- posttest design has generic limitations in terms of confidence in inferences we make compared to more robust control group – treatment group design. Due to the design limitations, it is necessary that other conditions which could have an influence on students' eating habit did not change in the pre test and post test phases of the study. As was discussed in earlier sections, the students' experienced similar conditions related to mess menu, work/ time schedules etc, across two phases. However, we cannot control for validity threats like subject maturation, adaptation, and extraneous factors like change in season etc. Therefore results of manipulation check are important, which do indicate the intended influence of the intervention. Second limitation relates to the manipulation check itself. Due to the limitation of online survey method, we could n't get set of individual responses. However the cumulative response data on each question indicated that the treatment has

comprehensively. Particularly interesting will be the interactive influence of personality and accountability contingencies on self regulatory behaviour.

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FIGURE 1.

Self Accountability Model

TABLE 1.

Dickey-Fuller test for checking stationarity of series 1.

Models	t value	Dickey Fuller	Stationarity
	for *	$t_{cr}(=)$ at 5%	$(t>t_{cr})$
1	-12.2	-3.45	Yes
2	-9.31	-2.89	Yes
3	-3.38	-1.95	Yes

* yt-1 coefficient.

TABLE 2.

Regression of Dinner wastage (yt) for series 1.

Model	b	t
	I	

TABLE 3.

Models	t value	Dickey Fuller t _{cr}	Stationarity
	for *	(=) at 5%	(t > t _{cr})
1	-6.6	-3.45	Yes
2	-6.4	-2.89	Yes
3	-1.24	-1.95	No

Dickey-Fuller test for checking stationarity of series 2.

* yt-1 coefficient.

TABLE 4.

Regression of Dinner wastage (yt) for series 2.

Model	b	t
(Constant)		2.44
Dinnerlag1	.15	1.15
Dinnerlag2	21	-1.61
Dinnerlag7	.21	1.49
Date	.17	1.17
	** <i>p</i> <0.05; * <i>p</i>	0<0.10

Panel 1.

No.	Items	N	Mean	S. d.	Median	Mode	% <u>></u> 66th%tile*
	Phase 1						
1	After weighing scale was introduced, I keenly noticed scale reading how much I am adding to the waste	54	3.94	1.63	4.5	5	70
2	After weighing scale was introduced, I keenly followed the wastage statistics displayed on white board.	54	4.00	1.24	4	4	83
3	I think weighing scale made me more conscious about the wastage	54	4.42	1.43	5	5	83
4	I think I consciously reduced wastage myself.	54	4.87	1.06	5	5	91
5	I think overall mess members reduced wastage because they became conscious of amount of wastage.	54	4.24	1.09	4	5	83
	Phase 2						
8	Currently I have stopped following the wastage statistics displayed on white board.	53	4.36	1.34	5	5	77
9	After weighing scale was removed, I have stopped noticing wastage (in my plate).	52	2.09	1.11	2	2	17
10	I do not think weighing scale can change individual wastage habits.	54	2.76	1.40	2	2	22
							* <u>></u> 4

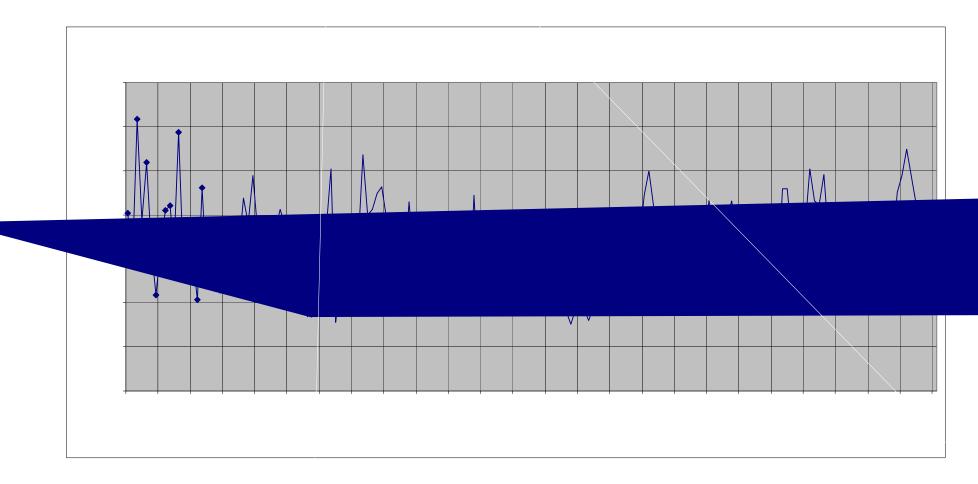
Manipulation check results.

Phase 1 manipulation check response profiles

Phase 2 manipulation check response profiles

FIGURE 2.

Wastage (in gms) per person trend (actual & weekly moving average plot) for all meals combined (dinner, lunch, breakfast, & high tea).



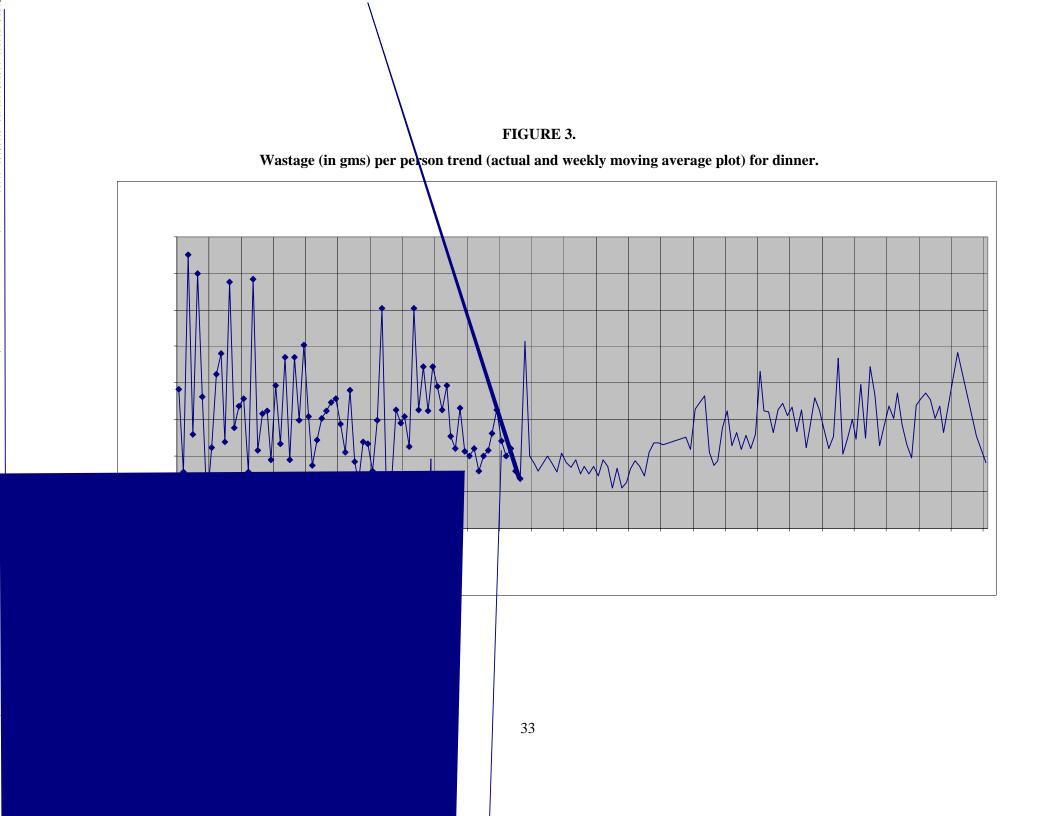


FIGURE 4.

Wastage (in gms) per person trend (actual and weekly moving average plot) for lunch.

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FIGURE 5.

Autocorrelation function (ACF) and Partial ACF (PACF) plots for series 1(pre test) data.

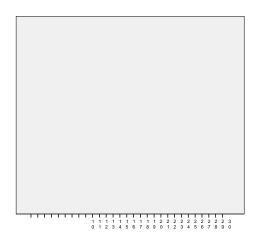
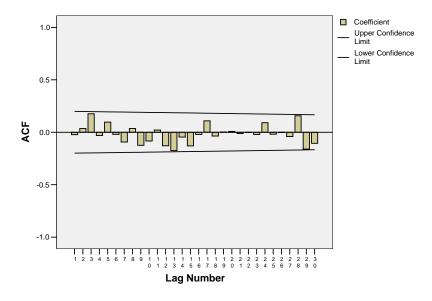


FIGURE 6.

ACF and PACF plots for studentized residuals of regression equation 1 for series1.



Studentized Residual



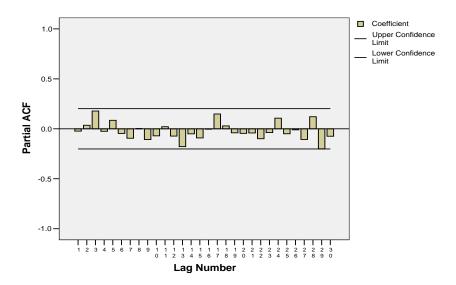
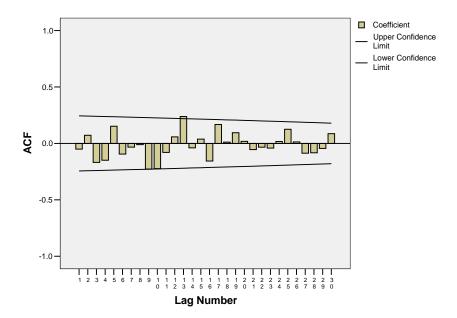


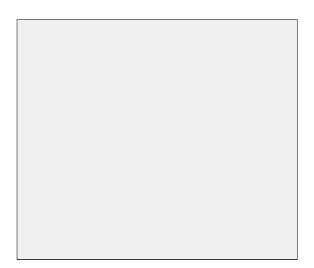
Figure 7.

Figure 8.

ACF and PACF plots for studentized residuals of regression equation 1 for series 2.

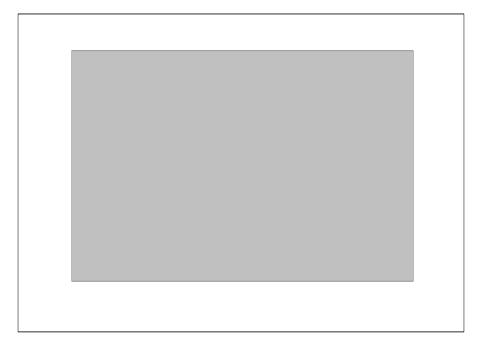


Studentized Residual



PANEL 2.

Total and Dinner wastage / per person trend only for Fridays across two series.



APPENDIX A: Online Survey questionnaire

A major endeavour of the outgoing messcom 2006-07 has been to reduce food wastage on all counts. One of the sources identified by committee was the food unconsumed and leftover by student members in their plates. One of the obvious reason was lower quality of food on a given day, and uneatables like peels and chicken bones. But the initial waste figures suggested wastage much beyond estimates accounted for by these reasons. To understand better as to why this is happening, we started collecting waste, measuring it, and displaying it in mess. We are conducting a short survey related to our study. All mess members are requested to respond to it online within a period of next week. It will not take more than 5 minutes of your time. It will be your contribution to a noble cause, as we may leave a small legacy for future batches.

Kindly tick mark in one empty box against each question on six - point scale ranging from 'strongly agree' to 'strongly disagree'.

1	2	3	4	5	6
strongly	disagree	somewhat	somewhat	agree	strongly
disagree		disagree	agree		agree

	1	2	3	4	5	6
After weighing scale was introduced, I keenly noticed scale reading how much I am adding to the waste						
After weighing scale was introduced, I keenly followed the wastage statistics displayed on white board.						
I think weighing scale made me more conscious about the wastage						
I think I consciously reduced wastage myself.						
I think overall mess members reduced wastage because they became conscious of amount of wastage.						

Did you notice removal of weighing scale (basket remained)?	Yes	No	
When did you first notice the removal of weighing scale?			
Currently I have stopped following the wastage statistics displayed on white board.			
After weighing scale was removed, I have stopped noticing wastage (in my plate).			

I do not think weighing scale can change individual wastage habits.			