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Relationship between Organizational Change Cynicism and Some Variables in Turkish Public Schools

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Organizational Change Cynicism. Job Satisfaction. Intention to Quit. Alienation

ABSTRACT
The present paper aims to determine the effects of the variable, the organizational change cynicism, on job satisfaction, intention of quitting and alienation variables. The research has been set up in correlational model. Via convenience sampling technique, 715 teachers selected from 15 schools in Kocaeli were the sample of the research. “Organizational Change Cynicism Scale”, “Job Satisfaction Scale”, “Quitting Scale” and “Alienation Scale” used as data collection tools. Correlation and regression analyses implemented to test the hypotheses and the method of the research. It was found out that the perception of organizational change cynicism is related to job satisfaction, intention of quitting job and alienation variables; and the study concluded that the variable of organizational change cynicism is a variable that predicts those other variables such as job satisfaction, the intention of quitting job and alienation.

INTRODUCTION

The developments in science and technology constantly create a pressure on social, economic and technologic systems and these pressures force organizations to make changes in their operation of structures, human resources, goals and operations. In addition, organizations endeavour to enhance the effectiveness and efficiency by implementing reforms and fast changes. The organizational change process is a painful one. Besides, it may push organization partners into negative feelings.

Since 2000s now on, there have been important changes and reforms in Turkish Education System which interests teachers. These are mainly; a) Renewal of the primary education programs, b) extending high-school education period to 4 years and making it compulsory education; c) changing the examination system in transition from primary education to high school education; d) changing of conditions in pass-fail system between grades; e) changing of conditions in pass-fail system between grades; f) constantly changing in university entrance exams; g) changes in optional lessons in primary and high school education programs; h) granting branch changing opportunity to primary school teachers’ one of the most important of all is removing pre-school education from being compulsory by giving up non-stop 8 years of compulsory education and arranging a new system of periodic 4+4+4 years of education periods. Such changes have brought a serial of changes in human behaviours in education organizations, in structural condition and the technology of organizations.

Obtaining achieving the expected results from these changes and reforms in education system is parallel to teachers’ adaptation to these changes as they are the most important element of education system (Bukova and Alkan 2005). The reform of periodic compulsory education application that has been reinforced in 2012 with 6287th law in Official Gazette (2012) has spawned significant changes and obscurities for both students and teachers. Guven (2012) investigated that these changes are decreasing the age of starting school and increasing the number of lessons in a week due to optional classes. Branch swapping application opportunity granted for primary school teachers who have ended up with being norm surplus due to the serious change caused by new education reform; that is, 30326 teachers, 23559 of which are primary school teachers, swapped their branches in 2012 [The Grand National Assembly of Turkey, 2012] and due to complaints of many teachers who declared to be suffering from these changes, Republican of Turkey Ministry of National Education (2012) granted the right of returning to previous branch for those teachers who had
changed their branches. Knowing how these changes in education applications are understood by employees is rather important in terms of effectiveness and efficiency of education organizations. Change in organizations is a painful process as it causes obscurity to employees and loads extra burdens to them. Having this, employees are mostly prone to be unwilling and resistant to change. This situation has both negative effects on changes and reforms to succeed and may influence education employees who are teachers, in negative ways. One of these negative effects is cynicism which is observed in teachers. In addition, the present study aims to examine the relation amongst the levels of organizational change cynicism in education organizations and some variables.

In general, organizational cynicism is defined as disappointments, desperateness, fury and angerliness of employees against their organizations (Wilkerson et al. 2008; Ozler et al. 2010). Dean et al. (1998) and Abraham (2000) handled organizational cynicism in five levels such as personality cynicism, organizational cynicism, professional cynicism, employee cynicism and organizational change cynicism. The study focuses on the organizational change cynicism of teachers. The organizational change cynicism is defined as pessimist point of view, lack of motivation and feeling of incompetence formed in employees as a perception that the changing attempts in the organizations will not succeed (Reichers et al. 1997; Abraham 2000; Wanous et al. 2000). Pessimist behaviours of employers and employees against the change organization create a defence mechanism in employees (Pitre 2004; Xerri et al. 2014) and employee creates an effort in organizations for everyday activities and formal organizational structures (Bergstrom et al. 2014). This mechanism is defined as organizational change cynicism.

It is critical to know the inputs and the outputs of change cynicism to make the activities for organizational efficiency and effectiveness constant (Wanberg and Banas 2000; Oreg 2006). While negative thoughts against the changes occurring in the organization, being pessimist that the changing attempts would fail, change amount, the approval of employees to the decision and the administrative effectiveness are defined as the inputs of organization change cynicism in literature (Wanous et al. 2000) losing motivation, low performance and exhausting (Dean et al. 1998) are defined as outputs. In addition, there are researches proving meaningful relations amongst organizational cynicism and some variables such as organizational politics, organizational justice, violating psychological agreements, organizational support, organizational stress, organizational citizenship behaviours, absence at work, performance, job satisfaction, organizational loyalty, alienation and exhausting (Stanley 1998; Tesluk et al. 1999; Treadway et al. 2004; James 2005). The present study examines the relationship between organizational change cynicism in education organizations and—from the outputs above—job satisfaction, the intention of quitting job and alienation levels.

Even though the research has been conducted on the teachers working at schools in Turkey, the model formed basing on the variables of this research has a worldwide validity. The research is important in these aspects.

The Relation of Organizational Change Cynicism and Job Satisfaction

Job satisfaction is defined as the individual emotional reaction of the employee for his/her job (Mercer 1997). Burnard et al. (1999) defined job satisfaction as "perceptive awards that employees get because of their jobs and the attitude, feeling that comes out when employees compares what they perceive and what they need"; Locke and Henne said "the experiences related to employees’ job and emotional satisfaction created by the meaning they attribute to their jobs" (Oshagbemi 2003).

It is stated that cynicism and job satisfaction/dissatisfaction includes desperateness, disappointment and distrust (Andersson 1996). When it is considered that organizational change cynicism is the emotions and attitudes developed against change attempts, it can be agreed that emotional mechanisms developed by employees against the organization may influence job satisfaction. It is noted that employees having organizational cynicism have low job satisfaction levels (Andersson and Bateman 1997; Dean et al. 1998; Abraham 2000; Johnson and O’Kelly 2003; Arabaci 2010; Sagir and Oguz 2012).
In the context of the relation between organizational change cynicism and job satisfaction, the first hypothesis of the study was created as follows:

**H1:** There is a meaningful and negative relationship between organizational change cynicism perception and job satisfaction. Organizational change cynicism perception is a meaningful predictor of job satisfaction.

### The Relationship between Organizational Change Cynicism and the Intention of Quitting Job

The intention of quitting job is considered as the negative attitudes and emotions when employees are not satisfied with the working conditions (Rusbelt et al. 1988). It is stated that negative attitudes emerged against organizational changes have positive effects on the intentions such as intention of quitting job, sabotage and leaking information (Lines 2005). Additionally, as bemoaning of employees increases absence at work (Reichers et al. 1997) and as they think the changes in organization will cause them to risk their job security and their status at work; it is noted that these are the reasons why they resist against changes in organizations (Mcmurry 1947). This resistance will cause an increase of intention to quit job. Based on this information, a hypothesis was created related to the relationship between organizational change cynicism and the intention of quitting job.

**H2:** There is a meaningful and positive relationship between organizational change cynicism perception and the intention of quitting job. Organizational change cynicism perception is a meaningful predictor of the intention of quitting job.

### The Relationship between Organizational Change Cynicism and Alienation

Alienation is the tendency of individuals to show work-based attitudes such as powerlessness (ineffectiveness of individuals over the conditions which influence their lives or lack of control), meaninglessness (obscure actions related to work of individuals for themselves), normlessness (rules lose their effectiveness at work or the belief that illegal actions are essential), social-isolation (goals or beliefs that are highly valued in society or organization have no value for the individual) and self-estrangement (the actions of individual to become a means for other satisfactions apart from his/her own satisfactions) (Seeman 1959).

It is noted that organizational cynicism in organizations causes alienation (Minihan 1980; Abraham 2000). Organizational cynicism consists of disappointment, tense and anxiety. It is seen that alienation against job involves some features of organizational cynicism (Dean et al. 1998). A study in which organizational cynicism levels, job satisfaction and self-alienation are examined, education supervisors have found a positive relationship between organizational cynicism and alienation (Arabaci 2010). Additionally, a supportive school culture is vital in times of change in which teacher communication and interaction are empowered (Zayim and Kondakci 2014). So, alienation may reduce the interaction of teachers in schools. Through this information, following hypothesis related to the relationship between organizational change cynicism and alienation was created.

**H3:** There is a meaningful and positive relationship between organizational change cynicism perception and alienation. Organizational change cynicism perception is a meaningful predictor of alienation.

### The Aim of the Paper

The aim of the paper is to manifest the relationship between organizational change cynicism and job satisfaction, intention of quitting job and alienation.

Answers to following questions were sought in the context of research.

- Does organizational change cynicism predict job satisfaction?
- Does organizational change cynicism predict the intention of quitting job?
- Does organizational change cynicism predict alienation?

### METHODOLOGY

### The Pattern of the Paper

The present paper was implemented through measuring the perceptions related to organizational change cynicism, job satisfaction, the intention of quitting job and alienation levels of participants at a certain time. In addition, it is a relational study as it examines the relationship between organizational change cynicism, job
satisfaction, the intention of quitting job and alienation variables.

Population and Sample

Public schools in Kocaeli province is the population of the study. According to the data of Provincial Directorate of National Education [MEB], there are 514 public schools and 13616 teachers work in Kocaeli province. The sampling implemented over individuals who were easy to access and wanted to participate in the study is called easy-to-access situation sampling (Yildirim and Simsek 2011). The paper sample includes 715 teachers from 15 schools in Kocaeli. Twenty seven scales removed from analysis because of the missing values in scales. Therefore 361 female and 327 male teachers (primary school teacher: 168, secondary school teacher: 223, high school teacher: 297) were the sample of the paper.

Data Collection and Data Collection Tools

Four different scales were used in the study to measure the organizational change cynicism, job satisfaction, the intention of quitting job and alienation of teachers. Items in Likert type data collection tools were degreed in 5 intervals.

The Scale of Organizational Change Cynicism

The 12 items scale developed by Wanous et al. (2000) was used. The scale of organizational change cynicism has three dimensions such as pessimism, personal features and situational features. Each dimension has 4 items in the scale. Reliability index was found .78 following the reliability analysis after the Turkish adaptation carried out by researchers.

Job Satisfaction Scale

Job satisfaction levels of teachers were measured by the scale developed by Brayfield and Rothe (1951) with 5 items. Reliability index of the scale was calculated as .83 following the reliability analysis after the Turkish adaptation carried out by researchers.

The Scale of the Intention of Quitting Job

The intention of quitting job of teachers was measured by the “intention of quitting job” scale developed by Hanisch and Hulin (1990; 1991) and adapted to Turkish by (Saridede 2004). Reliability index of the scale was calculated as .72.

RESULTS

It is seen that the organizational change cynicism perception levels of teachers are medium (x=3.07), job satisfaction levels are high (x=3.93); the intention of quitting job (x=1.67) and alienation (x=2.22) levels are low in Table 1.

In the correlation analysis carried out to find out the relationship between the organizational change cynicism perceptions and job satisfaction of teachers, a low negative and meaningful relationship was found out between cynicism perceptions and job satisfaction (r= -.262; p<.01). As the change cynicism perception levels of teachers increase, job satisfaction levels decrease. In the correlation analysis carried out to find out the relationship between the organizational change cynicism perceptions and the intention of quitting job of teachers, a medium level, positive and meaningful relationship was found out between cynicism perceptions and job satisfaction (r= .301; p<.01). As the change cynicism perception levels of teachers increase, the intention of quitting job levels decrease in Table 1. Similarly, a low level, positive and meaningful relationship was found out between cynicism perceptions and the alienation of teachers was observed (r= .192; p<.01) in Table 1. As the change cynicism perceptions increases, the alienation levels increases as well.

A simple regression analysis was implemented related to the effect of organizational change cynicism variable to the predicted variables which are job satisfaction, the intention of quitting job and alienation, the results are given in Table 2. It was found out that the variable of organizational change cynicism is a meaningful predictor of those variables which are job satisfaction (R=0.262, R²=0.069, p<.01), the intention of quitting job (R=0.301, R²=0.09, p<.01) and alienation (R=0.192, R²=0.037, p<.01). It was also found out
that the variable of organizational change cynicism meaningfully explains the %7 of total variance in job satisfaction; %9 of total variance in the intention of quitting job; and %4 of total variance in alienation level in Table 2.

It was proved that multiple regression models formed to observe if the sub-dimensions of organizational change cynicism predict the job satisfaction was meaningful. The sub-dimensions of change cynicism explain the %7 of total variance in the job satisfaction levels of teachers (R = 0.27, R² = 0.073, p < .01). However, while pessimism (α = -.211; p < .01) and situational attribution (α = -.076; p < .05), which are sub-dimensions of organizational change cynicism predict the job satisfaction was meaningful. The sub-dimensions of change cynicism explain the %7 of total variance in the job satisfaction levels of teachers (R = 0.27, R² = 0.073, p < .01). However, while pessimism (α = -.211; p < .01) and situational attribution (α = -.076; p < .05), which are sub-dimensions of change cynicism explain the %7 of total variance in the job satisfaction levels of teachers (R = 0.27, R² = 0.073, p < .01).

### Table 1: The correlation values related to variables (n=688)

<table>
<thead>
<tr>
<th>Variables</th>
<th>X</th>
<th>Sd</th>
<th>OCC</th>
<th>P</th>
<th>DA</th>
<th>SA</th>
<th>JS</th>
<th>IQJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational change cynicism (OCC)</td>
<td>3.07</td>
<td>0.67</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pessimism (P)</td>
<td>3.14</td>
<td>1.01</td>
<td>0.865**</td>
<td>0.875**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dispositional attribution (DA)</td>
<td>3.07</td>
<td>1.09</td>
<td>0.316**</td>
<td>0.04</td>
<td>0.029</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Situational attribution (SA)</td>
<td>3.01</td>
<td>0.56</td>
<td>0.262**</td>
<td>0.255**</td>
<td>0.201**</td>
<td>0.087</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job satisfaction (JS)</td>
<td>3.93</td>
<td>0.88</td>
<td>0.301**</td>
<td>0.272**</td>
<td>0.23**</td>
<td>0.138**</td>
<td>-0.552**</td>
<td></td>
</tr>
<tr>
<td>Intention of quitting Job (IQJ)</td>
<td>1.67</td>
<td>0.91</td>
<td></td>
<td>0.188**</td>
<td>0.160**</td>
<td>0.036</td>
<td>-0.713**</td>
<td>0.431**</td>
</tr>
<tr>
<td>Alienation (A)</td>
<td>2.14</td>
<td>0.78</td>
<td>0.192**</td>
<td></td>
<td>0.187**</td>
<td>0.029</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Correlation is meaningful within 0.01 level

### Table 2: The regression results between job satisfaction-the intention of quitting job-alienation and organizational change cynicism

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Dependent variables</th>
<th>Quitting job</th>
<th>The intention of job satisfaction</th>
<th>Alienation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>A</td>
<td>T</td>
<td>p</td>
</tr>
<tr>
<td>Organizational</td>
<td>-.26</td>
<td></td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Change Cynicism</td>
<td>-7.104*</td>
<td>.441</td>
<td></td>
<td>.000*</td>
</tr>
<tr>
<td>F</td>
<td>50.474</td>
<td>68.224</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>.262</td>
<td>.301</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>.069</td>
<td>.09</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*mmeaningful within p<.01 level

### Table 3: Regression results between job satisfaction-the intention of quitting job-alienation and the sub-dimensions of organizational change cynicism

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Dependent variables</th>
<th>The intention of Job satisfaction</th>
<th>Job satisfaction</th>
<th>Alienation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>A</td>
<td>T</td>
<td>p</td>
</tr>
<tr>
<td>Situational</td>
<td>.207</td>
<td>.127</td>
<td>0</td>
<td>.000*</td>
</tr>
<tr>
<td>Attribution</td>
<td>3.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pessimism</td>
<td>.178</td>
<td>.207</td>
<td>1.956</td>
<td>.051</td>
</tr>
<tr>
<td>Dispositional</td>
<td>.078</td>
<td>.093</td>
<td></td>
<td>.051</td>
</tr>
<tr>
<td>Attribution</td>
<td>24.034</td>
<td>17.964</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>.309</td>
<td>.270</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>.095</td>
<td>.073</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*mmeaningful within p<.01 level, ** meaning within p<.05 level
usions of organizational change cynicism meaningfully explain job satisfaction; dispositional attribution ($\beta = 0.063; p > 0.05$) does not explain job satisfaction meaningfully in Table 3.

Multiple regression analysis to detect the effect of pessimism, situational attribution and dispositional attribution variables, which are sub-dimensions of organizational change cynicism, to the predicted variables such as job satisfaction, the intention of quitting job and alienation, the results are given in Table 3. It was found out that the multiple regression models formed to see if the sub-dimensions of organizational change cynicism predict the intention of quitting job is meaningful. The sub-dimensions of change cynicism explain 9% of total variance in the intention of quitting job levels of teachers. ($R = 0.309, R^2 = 0.095, p < 0.01$). However, while pessimism ($\beta = 0.207; p < 0.01$) and situational attribution ($\beta = 0.127; p < 0.01$), which are sub-dimensions of organizational change cynicism meaningfully explain job satisfaction; dispositional attribution ($\beta = 0.093; p > 0.05$) does not explain job satisfaction meaningfully in Table 3.

It was found out that the multiple regression models formed to detect if the sub-dimensions of organizational change cynicism predict alienation is meaningful. The sub-dimensions of change cynicism is a meaningful predictor of alienation. ($R = 0.197, R^2 = 0.039, p < 0.01$). The sub-dimensions of change cynicism explain 4% of total variance in alienation levels of teachers. While pessimism ($\beta = 0.143; p < 0.05$), one of the sub-dimensions of organizational change cynicism, meaningfully explains alienation; situational attribution ($\beta = 0.029; p > 0.05$) and dispositional attribution ($\beta = 0.067; p > 0.05$) do not meaningfully explain the intention of quitting job in Table 3.

**DISCUSSION**

The personal features, which are the dimensions of organizational change cynicism, have effects on predicting the variables of job satisfaction, the intention of quitting job and alienation. The dispositional attribution dimension of organizational change cynicism is about employees’ accusing others and feeling lack of motivation due to these accusations under the circumstances of the perception that changes and reforms will end up with failures. In addition, it is stated that instead of employees’ dispositional attribution, situational attribution comes into prominence when the administrators do not make any change or their influence are not sufficient in changes related to cynicism (Wanous et al. 2000). In this context, we can predict the ineffectiveness of dispositional attribution in predicting the variables of job satisfaction, the intention of quitting job and alienation that teachers attribute the failures in any changes made at school to situational features caused by pessimism instead of blaming one another.

The first finding of the paper is that there is a “low” level, meaningful and negative relationship between the organizational change cynicism perception of teachers and their job satisfaction. As the organizational change cynicism perception of teachers increases, their job satisfaction levels decrease. The literature supports this finding of the paper. In many researches (Andersson and Bateman 1997; Dean et al. 1998; Abraham 2000; Johnson and O’Kelly 2003; Altunoglu and Sarpkaya 2012), it is stated that the employees suffering from organizational cynicism have low job satisfaction levels. While teachers’ high job satisfaction levels have positive effects on increasing the productivity and effectiveness of the school, job dissatisfaction has negative effects on school and school employees. Thinking parallel to that there is a negative relationship between teachers’ organizational change cynicism and their job satisfaction. One of the important findings of the research is that pessimism and situational attribution, which are two of the sub-dimensions of organizational change cynicism, meaningfully explain the job satisfaction. This outcome attracts more attention to pessimism and situational attribution dimensions of organizational change cynicism.

The second finding of the paper is that there is a medium level, meaningful and positive relationship between the organizational change cynicism perception of teachers and their intention of quitting job. It is observed that when the organizational change cynicism perception of teachers increases, their intentions of quitting job increases simultaneously. It is stated that negative attitudes against organizational changes have positive effects on the intention of quitting job, sabotage and leaking information (Lines 2005). The communication channels between management and employees about strategic change affect employees’ job security, salary, and benefits
Employees' high level intention of quitting job brings absence at work, quitting job and transferring job together. Increasing intention of quitting job causes negative effects for organizations such as qualified employee loss, increasing cost of looking for and bringing up qualified employees (Mobley 1982; Khatri et al. 1999; Takase et al. 2005). Employees should increase their performance and turnover with the help of expressing their views and feelings during strategic change (Jafri 2010). With it, university managers must understand how to reduce employee turnover, and improve performance of the employees in an organization under strategic change (Komodromos 2014). The intention of quitting job, which is costly and time-losing for employers, and which upsets employees by damaging the social relations among work groups in the organization, is the previous step of quitting and changing job (Daloglu 2002). That is why there is a common opinion that the intention of quitting job influences organizational effectiveness. To know the variables that influence the intention of quitting job is important in terms of predicting the levels intention of quitting job levels and taking cautions beforehand (Hwang et al. 2006). The pessimism and situational attribution dimensions of organizational change cynicism meaningfully explain the intention of quitting job, it is seen that dispositional attribution dimension does not meaningfully explain the intention of quitting job. Therefore, a decrease in teachers’ levels of organizational change cynicism perception will decrease their intentions of quitting job as well.

The third finding of the paper is that there is a “low” level, meaningful and positive relationship between organizational change cynicism perception of teachers and their alienation levels. It is stated in the literature that the organizational cynicism in organizations causes employees to alienate to job (Minihan 1980; Abraham 2000) and to self-alienate (Arabaci 2010; Costas and Fleming 2009). Organizations could focus on improving trust levels in order to prevent emotional exhaustion from causing organizational cynicism even depersonalization (Simha et al. 2014). The results of the paper conducted in education organizations support the literature. Sidorkin (Erjem 2005) sees that fast changes in education programs and in education organizations are the main reasons of alienation in education (Mann 2001). Understanding the importance of communication between organizational members may help to increase the clarity of relationship between organizational change and organizational cynicism in organizational life (Bergstrom et al. 2014). In addition, lowering the organizational change cynicism will lower the levels of alienation of teachers. It was found that only pessimism out of the sub-dimensions of organizational change cynicism meaningfully explain the alienation.

**CONCLUSION**

In the paper it is found out that the organizational change cynicism perception levels of teachers are medium, job satisfaction levels are high, and the intention of quitting job and alienation levels are low in Turkey.

As a consequence of the research, in general, it was found that the perception of organizational change cynicism is related to job satisfaction, the intention of quitting job and alienation variables and that organizational change cynicism is a variable that predicts job satisfaction, the intention of quitting job and alienation variables. Thus, the 3 hypotheses of the paper were accepted and its model was confirmed.

**RECOMMENDATIONS**

According to findings of the paper it can be argued that teachers’ job satisfaction levels can be increased by lowering their organizational change cynicism levels. Additionally, when we consider organizational change cynicism as a variable that influences the intention of quitting job, the negative effects of the intention of quitting job can be minimized by lowering the organizational cynicism levels, where, by lowering the pessimism cynicism perceptions of teachers, their alienations against their jobs can be lowered as well.

**REFERENCES**


