

Locus of control and mal adaptive schema as predictor Obsessive–compulsive symptom dimensions, in Armenian participants

1 Hamidreza Akbarikia Ebrahim, 2 Nabavizadeh, 3 Mahintaj Gohargani, 4 Seyed Ali Doustdar Tousi, 5 Nader Jafari Balalami, 6 Askari Asghari Ganji

1 PhD student of medical psychology, PhD student of psychophysiology, 2 Yerevan State University, 3 PhD student of psychophysiology in Orbeli institute of National Academy of science in Armenia, 4 PhD student of psychophysiology in Orbeli institute of National Academy of science in Armenia, 5 PhD student of psychology of National Academy of science in Armenia, 6 PhD student of psychology of National Academy of science in Armenia
1. Payame Noor university Iran, 2. Applied Science Bhzisti, 3 Education organization Yasouj, 4 Farhangian University, Sari Branch, 5 Babolsar School of Humanities and Social Sciences, 6. Mazandaran University, Farhangian University, babol. hamid_akbarikia@yahoo.com

Abstract: Obsessive compulsive symptoms (OC) characterized by recurrent unwanted thoughts, images or impulses (obsessions) that provoke anxiety, as well as attempts to resist or neutralize the obsessional anxiety through avoidance behavior and intentional overt or covert action. Although OCD previously was thought to be relatively rare in the general population, more recent epidemiological studies indicate a lifetime prevalence of approximately 2–3%. The main purpose of the present study was to test whether the obsessive compulsive groups are significant association with mal adaptive schema and locus of control in sub scale of internal, powerful others and chance. Examination of the individual betas indicated that, chance and powerful others were significant predictors of OCD arrangement and collecting symptomatology ($\beta = .32, p < .01$, arrangement $\beta = .51, P < .001$ collecting). In addition to this, only the interaction between mal adaptive schema and all obsessive compulsive subscale maintained its high significance ($\beta = .71, p < .001$). In the OCD group, multiple linear regression analyses revealed highest partial correlations between scores on the repeating dimension and mal adaptive schema ($\beta = .84, P = 0.01$). Other OCD symptom dimensions were significantly related to locus of control specific powerful others and chance dimension $P : (\beta = .48, p = 0.001)$ $C : (\beta = .37, P = 0.001)$. This result demonstrated that powerful others and chance were predictor for obsessive compulsive symptom. Present research demonstrated effect of Locus of Control on OCD and we found Higher locus of control scoring (more towards powerful others and chance) was significantly correlated to higher Y-BOCS total obsessive compulsive symptom and other subscale as well as aggression and repeating. There was no correlation between internal locus of control and OCD score.

[Hamidreza Akbarikia Ebrahim, Nabavizadeh, Mahintaj Gohargani, Seyed Ali Doustdar Tousi, Nader Jafari Balalami, Askari Asghari Ganji. **Locus of control and mal adaptive schema as predictor Obsessive–compulsive symptom dimensions, in Armenian participants.** *Life Sci J* 2013;10(4s):295-301] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 43

Keywords: mal adaptive schema, Locus of control; Obsessive-compulsive symptom subscale;

Correspondence: Payame Noor University, PO BOX 19395-3697 Tehran, IRAN

Introduction

Obsessive compulsive symptoms (OC) characterized by recurrent unwanted thoughts, images or impulses (obsessions) that provoke anxiety, as well as attempts to resist or neutralize the obsessional anxiety through avoidance behavior and intentional overt or covert actions (i.e., compulsive rituals; APA, 2000). The thematic variety of obsessions and rituals is well known (e.g., Foa & Kozak, 1995). Obsessions for example, might connect to contamination, violence and harm, mistakes, accurateness, sex, and religion. Rituals typically take the form of compulsive washing, checking, repeating pattern behaviors, and ordering or arranging; but might also involve covert acts such as praying, mental analyzing, and mentally

“replacing” (neutralizing) unwanted thoughts with more acceptable ones. Obsessions typically include thoughts of harm or death occurring to a loved one, chronic doubting, fears of contamination, blasphemous or socially unacceptable thoughts or impulses, counting, and a preoccupation with symmetry. Compulsions include excessive hand washing, placing objects symmetrically, repeatedly checking (e.g. that lights are off), or following set routines. Though intrusive thoughts and ritualistic behaviours are frequently reported in the background population (Rachman and de Silva, 1978; Salkovskis and Harrison, 1984; Muriset al., 1997), those seen in OCD are considered psychopathological as they are time consuming, cause distinguished distress, or significantly interfere with everyday functioning

(DSM-IV, 1994). Although OCD previously was thought to be relatively rare in the general population, more recent epidemiological studies indicate a lifetime prevalence of approximately 2–3% (American Psychiatric Association, 1994; Weissman et al., 1994). Moreover, obsessive thoughts and compulsive behaviors are extremely common in the general population.

Locus of control

Locus of control belief refers to individuals' generalized anticipation about whether they have control functions over what happens to them (Abbott, 1984). The concept of locus of control was defined by Rotter (1966) as "the degree to which individuals view themselves as controlling their own environment". This sense of control varies considerably among different individuals. Some people believe they can achieve anything they truly desire and hold themselves personally responsible for successes and failures. Others view problems or failures in life as misfortunes that they had little control over and successes as runs of good luck (Johnson, Stone, Altmaier, & Berdahl, 1998; Mirowsky, 1997). Locus of control has been studied in different ways and with a number of different constructs and approaches. Rotter (1966) focused primarily on internal and external locus of control rather than on personal efficacy as defined by Bandura (1977).

Locus of control connected with much aspects in life for example The results indicate that driving locus of control can be influenced by training and observer feedback, and the changes in driving locus of control can predict change in driving behaviors. Findings of the study point to the potential for organizations to enhance driving safety by influencing drivers' locus of control perceptions. (Jason et al 2011)

Locus of control, OCD and decision making have a clear relative, All the decision-making dimensions, excepted for intuitive style, are significantly correlated to locus of control scale: externally controlled individuals are more likely to use dependent and avoidant decision-making style while internally controlled persons are more likely to operate the rational style. (Baiocco et al 2009)

Schema:

Schema modes express state depending clusters of thoughts, emotions and behaviours. (Giesen-Bloo et al., 2006). Moreover, the emotional schema model is a meta emotional model, conforming to other meta-cognitive models of anxiety disorders (Wells, 2003, 2004). The cognitive model of OCD stresses the role of interpretations that

the patient gives of intrusive thoughts. Thus, although intrusive thoughts are universal, the OCD patient believes that he or she must attend to and control the intrusive thoughts, that uncontrolled thoughts will lead to negative consequences either inaction or dangerous effects, and that these thoughts are personally significant (Purdon & Clark, 1994; Rachman, 1997; Salkovskis & Kirk, 1997; Wells, 2000).

Method:

For the current study 150 Armenian participants were male 40% and 60% were female. Participant age ranged from 17 to 30 in students and the mean age for the sample was 21.78 (SD=3.52), and other samples were OCD patients with ranged age 25 to 58 and the mean age was 37.40 (SD=9.61). Participants completed Armenian version questionnaire batteries including measure of Levenson locus of control, and Ybocs OCD scale In patient with a primary OCD according to DSM-IV criteria were recruited,. The other samples are students recruited at the university were selected for this cross-sectional study. The participants comprised 110 under graduate and post graduate students without record in concealing center and other groups are co morbid psychiatric disorder patients in hospital and center of counseling in clinical psychology in Yerevan city, consecutively referred to a specialized OCD program of the 40 patients, OCD subjects have OCD in their life, and the other 110 students without OCD symptoms.

Instruments:

Yale-Brown Obsessive–Compulsive Scale:

The Yale-Brown Obsessive–Compulsive Scale (Y-BOCS; W.K. Goodman et al., 1989; Goodman, Price, Rasmussen, & Mazure, 1989) is a widely-used semi structured, clinician-administered measure that assesses the severity of obsessions and compulsions. Ratings are based on information provided by the patient and surety, as well as clinical observations. The Y-BOCS is administered in two parts: first, clinicians utilize a symptom checklist to determine the types of obsessions and/or compulsions experienced by the patient. Next, severity of these obsessions and compulsions are rated using a five point Likert scale ranging from 0 to 4, with higher scores indicating greater severity. The 10 severity items, which assess distress, frequency, interference, resistance, and symptom control, yield three scores: an Obsessions Severity Score (range = 0–20), a compulsions Severity Score (range = 0–20) and a Total Score (range = 0–40). Six additional items examine features that can be used to aid with

differential diagnosis and treatment (e.g., degree of insight, avoidance).

Levenson locus of control scale:

Locus of control was measured with Levenson, I, P and C scales. Each scale includes eight items and is designed to measure the extent to which individuals believe that outcomes are due to their own actions, to powerful others or to chance. Participants asked to rate each statement on a 4-point likert scale with 1=strongly disagree 4 strongly agree (Petrosky, Birkimer 1991). The Rotter (1966) I-E locus of control assesses an individual's attributions of control as being either internal (I) external (E) Levenson (Levenson 1973,) modified I-E scale to distinguish attribution of control to other persons, powerful others (P) from such other external factors as fate or luck, which she categorized as chance (C). Thus, her multidimensional instrument contains three separate I, P and C scales. In doing so, Levenson also attempted to reduce the biases in the Rotter . Levenson scale has Reliability and validity that had been identified by numerous researchers (Garcia, C., & Levenson, 1975).

Young schema questionnaire:

The Young schema Questionnaire – Short form (YSQ-) consists of 75 items and measures eighteen cognitive mal adaptive schemas. To establish the psychometric properties of the version of YSQ, The instrument and its sub-scales have a very good reliability, the α Cronbach coefficients run between .68 and .96. To test the discriminative validity of this measure, The YSQ has a good discriminative validity. Based on YSQ scores it can be predicted the social phobia development and significant correlation was found between YSQ and automatic thoughts scores. (Simona 2004).

Result

The main hypotheses of the present study were tested via multiple linear regression analyses. The total score of locus of control and its three subscales were used as the predicted variables. Table 1 show the first multiple linear regression analysis was conducted to examine whether locus of control interaction would predict obsessive compulsive symptomatology above and beyond the main effects of mal adaptive schema and locus of control. Examination of the individual betas

indicated that, chance and powerful others were still significant predictors of OCD arrangement and collecting symptomatology ($\beta=0.32$, $p<0.01$, arrangement $\beta=.51$, $P<.001$ collecting). In addition to this, only the interaction between schema and all obsessive compulsive subscale maintained its high significance ($\beta= .71$, $p< .001$). In the OCD group, multiple linear regression analyses revealed highest partial correlations between scores on the repeating dimension and mal adaptive schema ($\beta=.84$, $P=0.01$). other OCD symptom dimensions were significantly related to locus of control specific powerful others and chance dimension P: ($\beta=.48$ $p=0.001$) C: ($\beta=.37$ $P=0.001$). This result demonstrated that powerful others and chance were predictor for obsessive compulsive disorder.

A significant correlation was detected between aggression and Powerful others ($\beta=.31$, $P<0.001$) in the OCD group. No significant correlations between internal locus of control scores and OCD special repeating dimension ($\beta=.08$ $P=0.31$).

Table 2 shows that two variables, chance and powerful others were significantly associated with obsessive compulsive disorder. Respondents with higher levels of Internal scale were less likely to associate with obsessive compulsive disorder, whilst respondents with higher levels of Powerful Others LC scale were more likely to report poor health special OCD. Correlations are given in Table 2. A significant positive relation-ship was revealed between powerful others and chance with severity OCD ($r=.57$), while correlation between internal locus of control and severity OCD were very weak ($r=.016$) .in this research we found the highest correlation between severity OCD and mal adaptive schema ($r=.71$)

Significant correlations in highest level were found between collection sub scale, and powerful others ($r=.65$), and we found least level of correlation between internal locus of control and collection obsessive compulsive disorder ($r=.062$) so, no significant correlations were found between internal LOC and obsessive compulsive symptoms. Table 3 show some information about relation among under study variables that present study was found significant correlation among OCD sub scale and locus of control ($R=.67$ $p<001$).

B. Table 1. Regression analyses between OCD and locus of control in participants calculated by SPSS.
P<01 and P<05

predictor OCD Sub scale	Internal		Chance		Powerful others		Mal adaptiveschema	
	Beta	P.V	Beta	P.V	Beta	P.V	Beta	P.V
Contamination	.07	.35	.31	>.05	.32	>.05	.75	>01
Repeating	.08	.31	.33	>.05	.39	>.01	.84	>01
Arrangement	.12	.11	.39	>.01	.32	>.01	.76	>01
Aggression	.11	.30	.28	>.05	.31	>.05	.72	>01
Checking	.13	.11	.30	>.05	.32	>.05	.72	>01
Collecting	.15	.02	.29	>.01	.51	>01	.79	>01
OCD total	.14	.35	.37	>01	.48	>01	.71	>01

Table 2: Relation among obsessive compulsive dimension and subscale locus of control

Correlation Matrix

correlation	1	2	3	4	5	6	7	8	9	10	11
contaminate	*										
repeating	.677	1.000									
arranging	.639	.736	1.000								
aggression	.712	.668	.633	1.000							
checking	.609	.645	.592	.555	1.000						
collecting	.659	.729	.673	.661	.715	1.000					
internal	.035	.016	.093	.061	.104	.062	1.000				
others	.490	.567	.525	.454	.465	.658	-.244	1.000			
chance	.510	.573	.590	.480	.514	.613	.112	.586	1.000		
schema	.751	.845	.762	.724	.723	.794	.059	.657	.614	1.000	
Severity OCD	.641	.698	.565	.621	.599	.649	.104	.505	.484	.714	*

P<001

B. Table 3. Relation between OCD sub scale and locus of control as general calculates.

predictor Index	Sub scale of obsessive compulsion symptom			
	R	R ²	F	significant
internal	.155	.24	432	.856
Chance	.667	.44	13.99	>001
Powerful others	.677	.45	14.84	>001
schema	.91	.83	86.91	>001

P<001

Discussion

Present research demonstrated effect of Locus of Control on OCD and we found Higher locus of control scoring (more towards powerful others and chance) was significantly correlated to higher Y-BOCS total obsessive compulsive symptom and other subscale as well as aggression and repeating. There was no correlation between internal locus of control and OCD score.

Higher (external or powerful others) locus of control also was significantly correlated to contamination functioning and repeating had positive association between the higher locus of control scoring and the OCD may be explained partly by the fact that subjects with external locus of control have tendency to OCD, and obsessive compulsive patients should take internal control for their thought and actions. This would reduce their initiation to resist or to change particular acts (compulsions) and thought (obsession) which may give a greater compulsion severity in those with more external pattern of locus of control (Kamel 2006).

The results of the present study did not support the proposed main effects of locus of control on OCD. It was inconsistent with the results of McWilliams et al (2006) that found those with high powerful others of control typically believe that experiences, such as mental health care providers, had a great deal of impact and as such would be likely to cope with psychological disorder by try to obtain the assistance of such individuals. This finding could also indicate that looking for treatment from others is generally perceived as a passive coping plan of action that relies on the attempts of others.

The hypothesis that the OCD disease would be impaired in mal adaptive schema spatial in thought about control and mal adaptive schema was strong predictor for OCD repeating but not the predicted internal control. For the symptom dimensions, the hypothesis that patients in the dimension aggression would be impaired in cognition accuracy was confirmed. (Hodgson et al., 1999 Dittrich 2011),

This research found relationship between powerful locus of control and OCD, These results are consistent with suggestions that control evaluations are important in OCD, and also with intimation that control may interact with other OCD connected beliefs. For example, it could be that a vicious cycle is operating to escalate levels of OC beliefs and behaviors

This suggestion may perhaps help explain some of the inconsistencies in the literature regarding the relationship of responsibility to OCD symptoms (Rachman, Thordarson, Shafran, & Woody, 1995;

Tolin, Worhunsky, & Maltby, 2006); in some situations, those with low beliefs regarding responsibility may still perform OCD actions if they have a high desire for control. This is consistent with the higher levels of control appraisals in the group with OCD versus the group with other anxiety disorders. The role of desire for control may also contribute to the prevention of act of making one accustomed in OCD and thereby maintain OCD symptoms. That is, individuals with high request for control may be driven to keep performing OCD actions, which would result in increased feelings of responsibility and would prevent the disconfirmation of dysfunctional cognitions. The present research provides evidence that attention of control constructs may be warranted in cognitive theory. (Moulding et al 2008)

The result in present study was inconsistent with the design was found that we cannot address issues concerning the causal relationship between metacognitive belief change and symptom improvement during treatment. It could be the case that improvement in symptoms causes improvement in metacognitions rather than the contrary being the case. Exposure and response prevention therapy was originally based upon habituation, not cognitive change, which could suggests that change in cognitions is a consequence of symptom diminution (Solem et al 2009).

In this research we found correlation among mal adaptive schema and powerful others with OCD that supported by some researcher, the patterns of interference demonstrated by different OCD subtypes in preceding research indicate that disorder-related mal adaptive schema are only activated by idiosyncratic threat cues (Foa et al., 1993). This is further suggested by the finding that the major word danger was too ambiguous or abstract to activate the threat-related mal adaptive schema of obsessive-compulsives with contamination fears (Foa et al., 1993). The stimulus materials employed in the present study were chosen to represent the general fears of obsessive-compulsives who experience obsessions of contamination and doubt, respectively.

Conclusion

In conclusion, this study demonstrated that mal adaptive schema thought paired with powerful, chance and could influence obsessive compulsive symptoms. The increase on internal locus of control and decrease external locus of control (powerful others, chance) independently predicted changes in OCD behaviors. Organizations may design training interventions targeted on style of locus of control beliefs to enhance healthy in anxiety disorder especially obsessive compulsive symptom.

Acknowledgements:

This work has been cooperated by department medical psychology of mikhitar haratsi in Armenia and distance education (Payeme Noor University) in Mallayer .

References:

- 1-American Psychiatric Association. Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author,2000.
- 2-Foa, E. B., & Kozak, M. J. DSM-IV field trial: obsessive-compulsive disorder. *American Journal of Psychiatry*, 1995; 152:90-96.
- 3-Rachman, S., de Silva, P.,. Abnormal and normal obsessions. *Behav.Res. Ther.* 1978; 16: (4), 233–248.
- 4-Salkovskis, P.M., Harrison, J.,. Abnormal and normal obsessions a replication. *Behav. Res. Ther.* 1984;22 :(5), 549–552.
- 5-Muris, P., Merckelbach, H., Clavan, M. Abnormal and normal compulsions. *Behav. Res. Ther.* 1997; 249–252.
- 6-Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV),. American Psychiatric Association, 1994.
- 7-American Psychiatric Association. Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author, 1994.
- 7-Weissman, M.M., Bland, R.C., Canino, G.J., Greenwald, S., Hwu, H., Lee, C.K., Newman, S.C.,Oakley-Browne, M.A., Rubio-Stipek, M., Wickramaratne, P.J., Wittchen, H.-U., Yeh, E.-K. The cross national epidemiology of obsessive-compulsive disorder: the cross national collaborative group. *Journal of Clinical Psychiatry*, 1994; 55:(3), 5–10.
- 8-Abbott, M. W. Locus of control and treatment outcome in alcoholics. *Journal of Studies on Alcohol* . 1984; 45: 46–52.
- 9-Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 1966; 80: 1–28.
- 10-Johnson, B. D., Stone, G. L., Altmaier, E. M., & Berdahl, L. D. The relationship of demographic factors, locus of control and self-efficacy to successful nursing home adjustment. *Gerontologist* . 1998;38: 209–216.
- 11-Mirowsky, J. Age, subjective life expectancy, and the sense of control: the horizon hypothesis. *Journal of Gerontology: Social Sciences*.1997; 52: 125–134.
- 12-Jason L. Huang , J. Kevin Ford ..,Driving locus of control and driving behaviors: Inducing change through driver training ,*Transportation Research Part F xxx* ,2011.
- 13-Baiocco R , Laghi F,Alessio M D, Decision-making style among adolescents: Relationship with sensation seeking and locus of control., *Journal of Adolescence* 2009;32: 963-976.
- 14-Giesen-Bloo, J., van Dyck, R., Spinhoven, P., van Tilburg, W., Dirksen, C., van Asselt, T., et al.. Outpatient psychotherapy for borderline personality disorder. Randomized trial of maladaptive schema-focused therapy versus transference-focused psychotherapy. *Archives of General Psychiatry*, 2006; 63: 649–658.
- 15-Wells, A. Understanding and overcoming roadblocks in the treatment of anxiety disorders. In R. L. Leahy (Ed.), *Overcoming roadblocks in cognitive behavioral therapy*. New York: Springer,2003.
- 16-Wells, A. Meta-cognitive beliefs in the maintenance of worry and generalized anxiety disorder. In R. G.Heimberg, C. L. Turk, &D. S. Mennin (Eds.), *Generalized anxiety disorder: Advances in research and practice*. New York: The Guilford Press2004.
- 17-Purdon, C., & Clark, D. A. Obsessive intrusive thoughts in nonclinical subjects: II. Cognitive appraisal, emotional response and thought control strategies. *Behaviour Research and Therapy*, 1994; 32:403–410.
- 18-Rachman, S. J. A cognitive theory of obsessions. *Behaviour Research and Therapy* , . 1997;35: 793–802.
- 19-Salkovskis, P.M.,&Kirk, J. Obsessive-compulsive disorder. In D.M.Clark,&C.G. Fairburn (Eds.), *Science and practice of cognitive behavior therapy* New York: Oxford University Press1997; 179–208.
- 20-Wells, A. *Emotional disorders and metacognition: Innovative cognitive therapy*. New York: Wiley,2000.
- 21-Goodman, W. L., Price, L. H., Rasmussen, S. A., & Mazure, C. The Yale-Brown Obsessive Compulsive Scale (Y-BOCS): validity. *Archives of General Psychiatry*, 1989; 46: 1012–1016.
- 22-Petroski.M, Bikimer,j.The relationship Among locus of control, coping style And psychological symptoms reporting *journal of clinical psychology* ,. 1991;47: 3.
- 23-Levenson, H. Multidimensional locus of control in psychiatric patients. *Journal of Consulting and Clinical Psychology*, 1973; 41:3.397–404
- 24-Garcia, C., & Levenson, H. Differences between blacks' and whites' expectations of control by chance and powerful others. *Psychological Reports*, 1975; 37: 563–566

- 25-Simona .T.The Romanian version of young mal adaptiveschema questionnaire – short FORM 3 (YSQ-S3) Journal of Cognitive and Behavioral Psychotherapies.2004;2: Comments 0
- 26-McWilliams LA, Cox BJ, Enns MW,Clara IP Personality correlates of outpatient mental health service utilization: Findings from the U.S. national comorbidity survey. *Soc Psychiatry Psychiat Epidemiol*; 2006; 41:(5):357-363.
- 27-Kamel M, Asaad T, Haroun El Rasheed A, Shaker N, and Abulmagd M.,Impact of Personality Profile on Patients with Obsessive Compulsive Disorder in an Egyptian Sample 2006; 13:.3
- 28- Dittrich W H, Johansen T, Fineberg N A., Landro N I., Cognitive Performance and Specific Deficits in OCD Symptom Dimensions: II. Spatial Memory and Impaired Recognition of Visuospatial Object Locations, *German Journal of Psychiatry*, 2011.
- 29-Hodgson TL, Dittrich WH, Henderson L, Kennard C. Eye movements and spatial working memory in Parkinson's disease. *Neuropsychologia* 1999;37:927-938.
- 30-Rachman, S., Thordarson, D. S., Shafran, R., & Woody, S. R. Perceived responsibility: structure and significance. *Behaviour Research and Therapy*, 1995; 33: 779–784.
- 31-Tolin, D. F., Worhunsky, P., & Maltby, N. Are “obsessive” beliefs specific to OCD?: a comparison across anxiety disorders. *Behaviour Research and Therapy*, 2006; 44: 469–480.
- 32-Moulding R ., Doron G , Kyrios M , Nedeljkovic M, Desire for control, sense of control and obsessive-compulsive checking: An extension to clinical samples 2008 ;22:1472–1479
- 33-Solema, S , Håland Å , Vogela P A. Hansen B , Wells A., Change in metacognitions predicts outcome in obsessive-compulsive disorder patients undergoing treatment with exposure and response prevention *Behaviour Research and Therapy* 2009;47: 301–307
- 34-Foa, E. B., Ilai, D., McCarthy, P. R., Shoyer, B., & Murdock, T. Information processing in obsessive-compulsive disorder. *Cognitive Therapy and Research*, 1993; 17: 173–189.

2/16/2013