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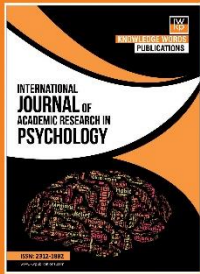
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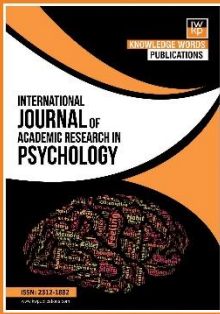


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## Shifts in Manager's Behavior as a Function of Enabling and Debilitating Contexts

R B N Sinha, N Lakshmi

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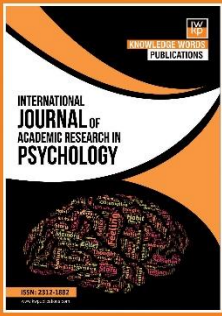
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# INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PSYCHOLOGY



## Shifts in Manager's Behavior as a Function of Enabling and Debilitating Contexts

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### Abstract

A sample of 150 respondents, 50 from each of three different locations in India, participated in a study that explored the shifts in the behavior of managers when they moved from disabling to enabling or from enabling to disabling context. The results were mixed in showing that the behavior in some instances improved as a function of the change from disabling to enabling and reversed as a result of the change from enabling to disabling context. Some of the behaviors were more positive in the enabling than in the disabling context. The paper suggests a need to explore the issues further.

**Keywords:** Context, Disabling, Enabling.

### Introduction

Cultures differ in context orientation. Some are high and while others are low. In the latter, people tend to think in terms of abstract principles and norms (Hall, 1976). A number of investigators (Hall, 1981; Hall & Hall, 1990; Triandis, 1984; Trompenaars, 1993) reported that Western cultures are low on context sensitivity while Eastern culture such as China, India and South Korea are high on context sensitivity (Miller, 1984; Markus & Kitayama, 1991). Indians, however, are highly sensitive to contexts in their thoughts and practices (Ramanujan, 1989). Hughes (2002) also reported that Indians think, talk and act differently with regard to the same person in the same situation at the same point of time. In a more recent study by Sinha et al. (2010) confirmed that Indians tend to sense others' mindset, selectively relate to those who are likely to be useful, judge the right time to think to initiate action and reach out to avail of opportunities. Their context sensitivity was expressed in the following concerns, abilities and behaviors. For example, some of the statements are as follows: to be concerned about what others think of them, to have ability to figure out what others expect, and to behave accordingly, to sense what others mean and intend. Indians tend to behave differently in different context and they tend to balance their thought and action in order to function effectively.

In a high context cultures, people tend to rely on their history, their status, their relationships and a plethora of other information, including religion, to assign meaning to an event. In a collectivist culture, people paid more attention to context than did people from individualist culture (Gudykunst, 1983). Gupta (2002) found that cooperative behavior and team work among Indians are extremely difficult in organizational context, though group solidarity is well known in times of crisis in Indian families. Another series of studies (e.g., Roland, 1988; Sinha & Kanungo, 1997) showed that Indians are sensitive to their contexts. They have been culturally socialized to view events and episodes from a long term perspectives. It has been found that majority of Indian perceive a situation and the responses to it as one episode in-on- going flow of interactive relationship between situations and responses (Sinha & Sinha, 1995). In the West people apply abstract principles and generalized norms to decide how to behave in different situations whereas Indians organize their thoughts, feelings and behaviours in order to meet specific contextual demands. Contexts have three dimensions of *desha* (place), *kala* (time) and *patra* (person), each having an enabling or debilitating potentials. Indians behave differently with different persons and different places as demanded by a situation – being positive in enabling and negative in disabling contexts (Sinha, 2009).

Enabling and debilitating contexts are likely to affect human behavior all over the world. Enabling contexts elicit different behavior. An organization having enabling contexts are characterized by a reasonable degree of security of job, opportunity and challenges to show their worth, a fair chance of getting rewarded for initiative and performance etc. However, Indians react to them sharply. Sinha et al. (2001, 2004) found that disabling contexts are more pervasive in the country. Further, Sinha et al. (2010) conducted a study in which four scenarios were given to the respondents to examine the extent to which a manager was likely to shift his behavior as a function of the replacement of a disabling superior with an enabling superior (person effect) and takeover of a disabling organization by an enabling one (place effect). The first two scenarios were compared to see how a manager was likely to shift his behavior in case a disabling boss was replaced with an enabling one. The disabling and enabling conditions disclosed that the manager was likely to shift his behavior significantly in all respects, except one- flattering the boss. The manager was more likely to turn highly motivated to perform well, come up with new innovative ideas and share them with the boss, communicate employees' feelings to the boss, and emulate the boss's style, but changing from imposing on his subordinates under disabling boss to encouraging and inspiring them under the enabling boss. The next two scenarios were compared to see how a manager was likely to shift his behavior in case of disabling and enabling condition of the organization. They found that a disabling context changes into enabling one, people were likely to shift towards more positive behavior. Sinha and his associates did not examine to see how a manager would likely to shift his behavior in case of enabling to disabling condition of the context (place). The present paper attempts to explore the possibility to shift in behavior and proposed the following hypotheses for verification.

**Hypothesis 1** *An enabling context will elicit more positive behavior than a disabling context.*

**Hypothesis 2** *A changes in manager's placement from disabling to enabling will lead to move towards more positive and less negative behavior.*

**Hypothesis 3** *A changes in manager's placement from enabling to disabling will cause a reversal towards less positive behavior and more negative behavior.*

## Method

### Sample

The sample comprised of 150 respondents drawn from three locations namely, Patna, Delhi and Mumbai. In all three locations, a sample of 50 respondents from each location participated in the study. They were the ones who were willing to participate. Fifty per cent of the respondents were Ph. D., 48 per cent postgraduate degrees holders and the remaining two per cent doing graduation. The respondents were on average 30.81 ( $SD=11.21$ ) yrs old with the range of 20 to 75yrs. They had an average of 7.56 ( $SD=9.28$ ) years of working experience. The three samples differed significantly in terms of age ( $F_{2, 147}= 7.76, p <.01$ ). However, Patna had the highest mean-age ( $M=35.24; SD= 15.86$ ) followed by Mumbai ( $M = 30.38; SD=7.70$ ) and Delhi ( $M= 26.82; SD=5.86$ ). The majority (65.30%) were males.

### Measures

A questionnaire consisting of three parts was developed. Part I had two scenarios.

**First scenario**, in which two civil engineers (Ashok and Vivek) were graduated from a highly reputed college in Bangalore. The GCC International which has specialized in constructing rail cum road-bridge at several places in India and abroad, hired them. Ashok was placed at a site in Bihar where a bridge was being constructed over the Ganges. Vivek was placed at a site in Gujarat where a bridge was being constructed over Narmada. Within three years, both Ashok and Vivek got two promotions and three slabs of raise in their pay and perks. The respondents had to guess the likelihood of 11 behaviors which led to their success.

**Second scenario** stated the following: As a company policy, Ashok and Vivek were transferred after three years, Ashok being placed at a new site in Gujarat and Vivek at a new site in Bihar. Respondents were again asked to guess how Ashok and Vivek would behave. In both scenarios, the respondents had to rate the likelihood of 11 behaviors that Ashok and Vivek might have performed in Scenario 1 and would perform in Scenario 2. The 11 behaviors that the respondents were asked to rate on a 4-point scale, ranging from Most Unlikely (1), Unlikely (2), Likely (3), and Most Likely (4).

Behaviors are given in the result section. Samples of them were as follows:

1. *Followed all rules and regulations of the company meticulously.*
2. *Encouraged and inspired his subordinates to get best out of them.*
3. *Will come up with new ideas that will improve his unit's performance.*
4. *Will keep his superiors pleased by telling how ideal bosses they are.*

Part II of the questionnaire enquired about the age, gender, education, years of experiences etc.

Part III had 10 statements regarding educational institutions, health facilities, job opportunities, transport and communications, law & order situation, corruption level recreational facilities neighbourhood, pollution level and about people designed to measure about the city on a 4-point Likert type scale in which the respondents were residing.

The study was based on the assumption that Bihar had a disabling while Gujarat had an enabling milieu. In order to substantiate it, the two states (Bihar and Gujarat) were also compared on number of dimensions. Gujarat was one of the highly developed states (ranked 5<sup>th</sup>) and Bihar (ranked 12<sup>th</sup>) on the basis of Gross State Domestic Product (GSDP) in 2014-2015 (Govt. of India, 2014). Gujarat state had 79.31 literacy rates whereas Bihar had 63.82 in 2011 (Census of India, 2011). Gujarat state has been ranked first amongst 20 major Indian states in terms of fixed capital investments and fourth in terms of total number of factories. Bihar's towns are far more crowded at 5,058 persons per sq km compared to 3,477 persons per sq km in Gujarat's urban areas. According to *Niti Aayog* data, per capita income in Gujarat at Rs 63,168 in 2013-14 at constant 2004-05 prices was about four times Bihar's per capita income, estimated at Rs 15,506. With regard to urbanization Bihar's had 2.5% where Gujarat 3.8%. Forty-two per cent of Gujarat's population lives in towns and cities compared to 11 per cent in Bihar (Census of India, 2011). There are just a few instances that illustrate the wide gap in development of the two states. Bihar compares poorly on access to basic amenities such as treated drinking water in taps (3.1% vs. 39.9%), electricity or lighting (16.4% vs. 90.4%) and LPG for cooking (8.1% vs. 38.3%). On the basis of above description of the two places (Bihar & Gujarat) where the managers were posted were considered as disabling (Bihar) and enabling (Gujarat). Data were collected from June to July 2016.

### Design

A 2 x 2 x 3 (Contexts x Persons x locations) factorial design was employed where the participants located at Patna, Delhi and Mumbai rated the positive and negative behaviors of two hypothetical managers, Ashok and Vivek, who worked and then shifted from disabling to enabling and from enabling to disabling conditions respectively.

### Results

As noted above the hypotheses were that managers behave more positively under enabling condition than under disabling ones, and if they shifted from disabling to enabling condition, their behavior becomes more positive while shifting from enabling to disabling, they suffered a reversal from positive to negative. The hypotheses were partially supported in some of the eleven behaviors which were examined in the present study. The findings were reported in Table 1 which indicated the significant effects of contexts, persons and locations and Table 2 that contained the mean values.

Insert Table 1 & Table 2 about Here

Table 1 disclosed that at least in two behaviors, the main effects of contexts were significant confirming hypothesis I. The mean scores of Tables 2 of these two behaviors showed that in the disabling ( $M = 1.78$ ) condition both Ashok and Vivek followed rules and regulations more meticulously (Item no. 1) than in the enabling ( $M = 1.76$ ) condition. On the other hand, both Ashok and Vivek tended to inspired their subordinates to get best out of them (Item no. 5) in enabling ( $M = 1.62$ ) condition than in the disabling ( $M = 1.52$ ) ones.

There were five behaviors in which the shifts from disabling to enabling and from enabling to disabling were found to be statistically significant. It was clear from Table 1 which confirmed hypothesis two and three. Table 2 provided the details. It was found that when Ashok moved from



disabling to enabling, he was reported more likely to inspired his subordinates in order to get best out of them (Item no. 5). When Vivek moved from enabling to disabling condition he was reported less likely to inspire his subordinates to get best out of them. Similarly, Ashok was reported to keep pleasing his superiors more likely when he moved from disabling to enabling while Vivek decreased this behavior when shifted from enabling to disabling. The remaining three behaviors (Item no. 6, 7, & 8) which were rather negative in nature , there trend was reverse i.e. Ashok was reported less likely to manipulate records to show his better performance to perceive just lucky and to visit his superiors at their residence offering services in enabling condition when shifted to disabling to enabling condition. On the other hand, Vivek was reported engaging in all these three behaviors more likely when he shifted from enabling to disabling condition. Thus, all three hypotheses were confirmed but only in sum behaviors not in all 11 behaviors which were included in the study.

So far as the main effects of persons and locations as well as their double and triple interactions were concerned, only one out of 11 behaviors revealed significant effects. They were not interest of the study and therefore ignored in discussion.

## Discussion

The present study aimed to contribute to our understanding of how context affects managers' behavior in an organization setting. Earlier work by Sinha (2010) showed that Indians are highly sensitive to their contexts. If the context is enabling, they organize their mindset in order to behave more positively. However, when the context is disabling, they resort to more defensive and negative behaviors out of their concern for serving their interest in short term perspective. However, contexts are not static. They often change and may change from negative to positive or from positive to negative. It necessitated arguing that when a context changes from negative to positive, the persons within that context will also change from less to more positive or negative to positive. By the same token when a context deteriorates from positive to negative, the person within that context will also down grade their behaviors. Both anecdotal and empirical evidence have been reported to confirm these trends (Sinha, et al. 2010). Sinha (1974) for example, reported that a participatory leader reverse to authoritarian leadership when the organizational culture changed.

However, these trends still need further confirmation. One multi authored study by Sinha et al. (2010) that was conducted in 12 different locations in which the first author was also a collaborator examined more rigorously how shift in the context affects managers' behaviors. The study reported to either in superiors' behaviors from autocratic to participatory or the organization being transformed from short term profit making to long term performance as well as person originated management.

The findings confirmed that shift either in superiors' managerial styles or in the management of the organizations towards more positive side improves the various behaviors of managers. However, this study had a limitation that it did not examined whether a shift from more positive to negative managerial or organizational styles adversely affects managers' behaviors. The present study examined both the impacts of positive as well as negative shift in the contexts along with rechecking the main effects of positive and negative contexts.

The present study indeed confirmed that managers in at least in some cases behave more positively in enabling conditions and more negatively in disabling conditions. Furthermore, when condition shift from disabling to enabling, managers' behaviors improve. On the other hand, when

the context turns to be negative managers' behavior becomes more negative. However, the trend was observed in some of the behaviors not in others may be because the contexts in this study operationalized differently than the previous study. Contexts of the managerial behaviors can have two levels: organization and the surroundings milieu. There is a vast literature how organizational structure and cultural dimensions affect managers' behaviors.

Organization as a context is itself part of the surrounding culture. The present study tapped impact of the surroundings cultures at the levels of states. Gujarat was found to be more developed states than Bihar on the basis of hard evidences. Therefore, the developed state was considered to be in enabling context and the less developed state of Bihar was considered to be disabling context. A better strategy for more comprehensive understanding of contexts on managers' behavior should include both organizational context and its surrounding context in one study.

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Table 1 Two-Way ANOVA Displaying Effects of Contexts, Persons &amp; Locations on Managers'

Statements	Context (C) <sup>a</sup>	Person (P) <sup>a</sup>	Location (L) <sup>b</sup>	C x P <sup>a</sup>	C x L <sup>b</sup>	P x L <sup>b</sup>	C x P x L <sup>b</sup>
1. Follow rules and regulations meticulously	5.47*	2.35	4.76**	.22	.21	.22	1.50
2. Come up with new ideas that improved performance	.37	.02	.09	.03	.21	.21	.42
3. Kept Superiors pleased telling how ideal bosses they were.	.99	1.19	1.84	4.60*	.02	.55	3.97*
4. More & more work completed on schedule.	.87	.37	4.91**	.02	2.70	.09	.12
5. Inspired subordinates to get best out of them.	4.63*	3.38	.79	5.63**	15.95*	13.43*	1.23
6. Manipulate records to show his better performance.	.23	.61	.59	7.22**	.68	.47	.60
7. Just lucky.	2.95	.21	3.26	10.09*	.36	.65	1.44
8. Visit his superiors at their residence and offer services.	1.27	3.46	.65	5.28*	.12	.66	.48
9. High technical competence and high motivation.	2.74	.36	1.29	1.61	2.46	.21	.19
10. Favored subordinates who praised him publicly.	.10	5.13*	.63	3.16	.28	.14	1.53
11. Maintained connections contractors who lobbied for him to management.	1.37	1.90	2.20	.39	.67	.09	.50

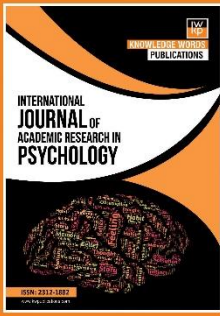
## Behavior

N=150, \*  $p < .05$ , \*\*  $p < .01$ , <sup>a</sup>  $df = 1/147$ ; <sup>b</sup>  $df = 2/147$



**Table 2 Mean & SD (parenthesis) of Managers' Success Behaviors in Disabling and Enabling Contexts.**

Statements	Ashok		Vivek	
	Disabling	Enabling	Enabling	Disabling
<b>1. Follow rules and regulations meticulously</b>	1.79 (.63)	1.68 (.70)	1.84(.76)	1.77(.71)
<b>2. Come up with new ideas that improved performance</b>	1.60(.68)	1.58(.67)	1.61(.61)	1.58(.66)
<b>3. Kept Superiors pleased telling how ideal bosses they were.</b>	2.27 (.87)	<b>2.41(.88)</b>	2.42(.88)	2.36(.89)
<b>4. More &amp; more work completed on schedule.</b>	1.97(.71)	<b>2.02(.79)</b>	2.01(.73)	<b>2.04(.83)</b>
<b>5. Inspired subordinates to get best out of them.</b>	1.59(.65)	<b>1.62(.60)</b>	1.63(.65)	1.45(.68)
<b>6. Manipulate records to show his better performance.</b>	2.78(.97)	2.60(.94)	2.63(.95)	<b>2.77(.94)</b>
<b>7. Just lucky.</b>	2.61(.88)	2.50(.83)	2.41(.86)	<b>2.66(.84)</b>
<b>8. Visit his superiors at their residence and offer services.</b>	2.83(.89)	2.66(.89)	2.65(.91)	<b>2.71(.95)</b>
<b>9. High technical competence and high motivation.</b>	1.67(.64)	1.55(.61)	<b>1.63(.63)</b>	<b>1.63(.63)</b>
<b>10. Favored subordinates who praised him publicly.</b>	2.47(.84)	2.37(.83)	2.30(.85)	<b>2.37(.86)</b>
<b>11. Maintained connections contractors who lobbied for him to management.</b>	2.19(.87)	2.12(.87)	<b>2.22(.90)</b>	2.21(.94)



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## The Relationship between Anxiety, Depression, and Quality of Life among Women with Breast Cancer

Majid Sadoughi, Zahra Mohammad Salehi

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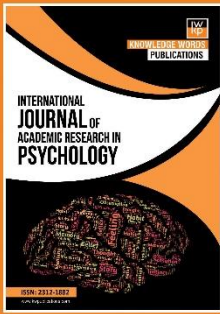
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# INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PSYCHOLOGY



## The Relationship between Anxiety, Depression, and Quality of Life among Women with Breast Cancer

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### Abstract

Anxiety and depression, as common psychological disturbances among patients with breast cancer, might negatively influence their quality of life. The present study aims to explore the relationship between anxiety and depression, in one hand, and quality of life, in the other hand, among these patients. In the present correlational study, 97 women with breast cancer referring to Seyedoshohada Hospital, Isfahan, Iran, were selected through simple random sampling. The participants filled out Life Orientation Test (LOT), Snyder Adult Hope Scale, and Hospital Anxiety and Depression Scale (HADS). Pearson product moment correlation and independent samples *t*-test were run in SPSS (version 22) to analyze the data. The mean of anxiety, depression, and Quality of Life were  $10.21 \pm 4.79$ ,  $8.31 \pm 4.74$ , and  $63.74 \pm 19.20$ , respectively. The total score of anxiety and depression was  $18.53 \pm 9.02$ . The Pearson correlation coefficient indicated a statistically significant inverse relationship between Quality of Life and anxiety ( $r = -.48$ ,  $p < .01$ ) as well as depression ( $r = -.52$ ,  $p < .01$ ), indicating patients with more anxiety and depression had lower quality of life. Therefore, it is highly suggested that, along with conventional treatments, initial assessment and screening of anxiety and depression be paid more attention, and necessary interventions be made to reduce them among patients with breast cancer, enhancing these patients' quality of life.

**Keywords:** Breast Cancer, Anxiety, Depression, Quality of Life.

### Introduction

Cancer is a major public health problem throughout the world (Bektas & Demir, 2016). Causing a large number of deaths, it increases the risk of psychiatric diseases (Tokgoz, 2008). One-third of patients with cancer have mental health disorders and are in dire need of appropriate psychological treatment (Singer, Das-Munshi, & Braehler, 2009). Rajandram et al (2011) maintains, anxiety and depression are widely known as common psychological distresses among most patients with cancer. In fact, anxiety and depression are caused, to a great extent, by surgical interventions, long-term and intensive

treatments such as radiotherapy and chemotherapy, and uncertainties during disease progression (Dedeli, Fadiloglu, & Uslu, 2008). Diagnosis and treatment of cancer might produce significant changes for both cancer patients and their family members in their relationships, roles, and psychological health (Ferrell et al., 1997). Cancer is usually accompanied by much stress as families encounter several challenges in the treatment process, producing a negative impact on their quality of life (QOL) (Petrie, Logan, & DeGrasse, 2001).

Quality of life reflects the patient's perception of well-being. It has several functioning aspects such as psychological, physical, cognitive, and social (O'Neil et al., 2013). It is one of the criteria proposed for measuring health. More specifically, as the World Health Organization (WHO) has suggested, health is not just lack of disease but the existence of a state of complete physical, mental, and social welfare (Hussein, 2011). Much attention has been paid to quality of life among researchers. Li and Yuan (2011) found that anxiety, depression, and quality of life are affected by demographic and socio-economic factors such as age, social support, financial status. Psychological and QoL assessment are important in that they can be good predictors for a patient's survival (Bredal et al., 2011).

Overall, considering recent developments in cancer treatment, patients with cancer have higher chances of survival and expect to live with less functional loss and higher quality of life. Therefore, problems concerning the quality of life have internationally drawn the attention of several researchers (Karakoyun-Celik et al., 2010). As one of the important aspects of quality of life and an essential part of clinical oncology, psychological well-being is considered very important for patients with malignant diseases who are constantly dealing with their psychological distress (Brown, McMillan, & Milroy, 2005). The symptoms of cancer therapy affect cancer patients' quality of life (Demir, 2015). Several studies have shown that anxiety and depression, which occur during the diagnosis and treatment of cancer, increase physical and psychological symptoms, negatively affect quality of life, and decrease treatment adaptation (Kutlu et al., 2011; Satin, Linden, & Phillips, 2009). Bektas and Demir (2016) found that as the duration of diseases increases, anxiety and depression increase, leading to decreased quality of life. There have been few attempts to explore the relationship between quality of life and anxiety and depression among female patients with cancer. Moreover, due to cultural differences, using depression and quality of life scales developed specifically for western cultures might produce different results in other cultures and societies. Studying German, Japanese, and South Korean patients with breast cancer found that depression is a critical psychological factor affecting the quality of life (Shim, et al., 2006). In their cross-cultural research, depression was found to significantly decrease the quality of life of German and Japanese patients; moreover, none of the stress factors including depression anxiety, and post-traumatic stress disorder were reported to have a negative effect on the quality of life in South Korean patients. Considering these cultural difference, it is necessary to investigate this phenomenon among Iranian patients. However, our extensive review of literature found no study exploring the relationship between anxiety, depression, and quality of life among Iranian female patients with cancer. The current study aims to examine depression, anxiety, and quality of life among Iranian women with breast cancer under chemotherapy.

## Method

The present study was descriptive and cross-sectional with a correlational design. Using simple random sampling, 97 patients with breast cancer referring to Seyedoshohada Hospital, Isfahan, were



selected. The inclusion criteria were as follows: only patients within the age range of 20-60 years old who had been diagnosed with breast cancer at least six months before were chosen; moreover, they had not taken any psychiatric drug at least six months before, did not suffer any other chronic disease, and had no substance abuse history. The aforementioned criteria were examined based on the patients' records and self-reports. Using SPSS (version 22), the data were analyzed through descriptive statistics (mean, standard deviation) and inferential statistics (Pearson product moment correlation, one-way ANOVA). The data collection instruments included demographic questions, Hospital Anxiety and Depression Scale (HADS), Cancer Quality-of-Life Questionnaire C30 (EORTC QLQ-C30), all of which were administered with written informed consent.

### **Instruments**

**The Hospital Anxiety and Depression Scale:** This instrument, designed by Zigmond and Snaith in 1983, is widely used to screen for psychiatric problems and assess depression and anxiety in outpatients. It has two subscales, namely, anxiety, and depression, each of which has seven items rated on a four-point Likert scale. The cutoff point has been suggested as 11, and any score higher than this is of clinical importance (Tsunoda et al., 2005). Using an Iranian sample, the Cronbach's alpha of anxiety and depression subscales were reported as .85 and .71, respectively. In the current study, the Cronbach's alpha was calculated .82 and .84 for anxiety and depression subscales.

### **EORTC Quality-of-Life Questionnaire C30 (QLQ-C30)**

The EORTC QLQ-C30 has been developed for cancer patients' self-assessment of their quality of life. The QLQ-C30 is a 30-item instrument that evaluates, in a multi-dimensional format (a four-point scale, from "not at all" to "very much," for items 1 to 28; a seven-point scale for items 29 and 30), several areas of QoL. The functioning scales evaluate physical function (PF), role function (RF), cognitive function (CF), emotional function (EF), social function (SF), and global QoL. The symptom scales assess physical symptoms commonly reported by patients with cancer like fatigue, pain, dyspnea, insomnia, loss of appetite, and so on (Tsunoda et al., 2005). This instrument has been validated in an Iranian sample, indicating an acceptable validity and reliability (Safaei & Moghimi Dehkordi, 2007). The Cronbach's alpha reliability coefficient was calculated as .89 in the current study.

### **Results**

Table 1 shows the frequency and percentage of the participants in addition to mean and standard deviation of their global health status/QoL, anxiety, and depression based on age and SES.

Table 1. Descriptive statistics of global health status/QoL, anxiety, and depression based on age and SES

		N (percent)	Total QoL	Anxiety	Depression
Age	20-30	8 (8.2)	68.75±16.51	6.84±3.03	9.87±2.03
	30-40	23 (23.7)	65.57±20.76	10.04±5.23	8.26±4.60
	40-50	37 (38.1)	64.18±19.23	10.12±4.67	7.8±4.89
	50-60	29 (29.9)	60.34±18.98	10.55±5.28	9.35±5.08
	Statistical test		F=.55 , P=.64	F=.073 , P=.97	F=.81 , P=.48
SES	High	54 (55.7)	56.94±17.11	7.30±4.47	5.7±3.89
	average	23 (23.7)	65.21±16.21	9.71±4.53	7.00±4.33
	Low	20 (20.6)	80.41±17.78	11.49±4.57	9.82±4.71
	Statistical test		F=13.94 , P=0.00	F=6.4 , P=.001	F=7.36 , P=.001

The results of one-way ANOVA (Table 1) showed that there is no statistically significant difference among different age groups in terms of their global health status/QoL ( $F=.55$  ,  $P=.64$ ); however, there is a statistically significant difference among patients with different SES levels in terms of global health status/QoL. As to anxiety and depression, no statistically significant difference was found among different age groups. Moreover, there is a statistically difference among patients with different SES levels in terms of depression; more specifically, post hoc analysis showed that patients with average and high SES levels experience less depression than patients with low SES levels, but there was no statistically significant difference between patients with average and high SES in terms of depression. Furthermore, there is a statistically significant difference among all SES levels in terms of anxiety, and patients with average and high SES experience less anxiety than patients with low SES levels.

Table 2. Descriptive statistics and correlations of QoL and its aspects with anxiety and depression

Variable	Mean	SD	Anxiety	Depression
1. Quality of life	63.74	19.20	-.48**	-.52**
2. Physical functioning	62.19	22.74	-.18	-.24*
3. Role play functioning	59.10	29.56	-.38**	-.51**
4. Emotional functioning	42.18	29.96	-.69**	-.65**
5. Cognitive functioning	59.10	29.95	-.58**	-.48**
6. Social functioning	55.94	31.67	-.47**	-.51**

\*  $p < .05$       \*\*  $p < .01$

According to Table 2, there is a significant negative correlation between global health status/QoL and its aspects, in one hand, and depression, in the other hand. Moreover, anxiety has a significant negative correlation with global health status/QoL and its aspects except physical functioning.

## Discussion

Much attention has been paid to psychological distress among patients with breast cancer (Srivastava et al., 2016) Mostly related to fear of recurrence, depression and anxiety are considered as the most prevalent psychological disorders in breast cancer patients (Schmid-Büchi et al., 2008) and can cause

mental disturbance in cancer patients (Karakas & Okanlı, 2014). The results of this study indicate that there is a substantial relationship between anxiety, depression, and quality of life in breast cancer patients, which is in line with several studies. Previous research has indicated the effect of anxiety and depression on quality of life (Buzgova, Jarosova, & Hajnova, 2015; Skarstein et al., 2000; Schleife et al., 2014; Ell et al., 2005; Alacacioglu et al., 2010; Bektas & Demir, 2016; Zenger et al., 2010; Frick, Tyroller, & Panzer, 2007; Tsunoda et al., 2005; So et al., 2010; Hutter et al., 2013; Karakoyun-Celik et al., 2010). In addition, anxiety may also cause delay or interference with the seeking of medical care (Spencer, Carver, & Price, 1998). Along with immunosuppressive effects, long-term anxiety compromises the patient and might impair cognitive functioning level, especially when important health decisions must be made (Van Oers & Schlebusch, 2013). The subjective feeling about treatment ineffectiveness may trigger an anxious reaction concerning the disease progress or life expectancy (Wong & Bramwell, 1992). Massie and Holland (Massie & Holland, 1987) described four anxiety-inducing situations, namely, while waiting to receive their diagnosis, prior to major diagnostic tests, before an operation, and while waiting for test results. Upon the diagnosis of breast cancer, anxiety can lead to inability to concentrate, diminished sleep, appetite loss, irritability, and intrusive thoughts about the future.

Moreover, the results of the present study showed that patients with breast cancer experience high levels of depression, accompanied with low quality of life. To justify this, depression causes increased suicide risk (Misono et al., 2008) and reduced survival expectation (Satin et al., 2009). Buzgova (2015) also found that physical, emotional, and social functioning are negatively affected by anxiety and depression. Research has also shown that depression has adverse effects on interpersonal relationships, job performance, stress, and perceptions of health and physical symptoms (Ng et al., 2016).

This study showed that there was no difference between different age groups in terms of anxiety and depression. Tavoli et al (2007) found that age has no effect on depression. Contrary to the findings of the present study, several studies have reported that middle-aged and elderly patients experience higher anxiety and depression (Nikbakhsh et al., 2014; Ozkan, Ogce, & Koca, 2007).

Hopelessness and despair have been widely reported to possibly increase anxiety and depression (Kavradım & Ozer, 2014). Moreover, psychological symptoms may reduce the efficiency of chemotherapy for breast cancer patients (Su et al., 2005). Although there is dearth of research on the mechanism through which psychological distress negatively influences the efficacy of the treatment, the role of psychological distress in causing stress, which can, in turn, change hormonal and neuronal secretions and thus the biological activity of breast cancer cells, has been documented (Drell IV et al., 2003). Therefore, the early diagnosis as well as effective management of psychological symptoms can enhance the effectiveness of cancer treatment (Wardle et al., 2015). Overall, the aforementioned points imply that cancer patients' physical and psychosocial distress can influence their quality of life.

As Pandey et al (2006) maintains, there are four forms of anxiety: situational anxiety, disease-related anxiety, treatment-related anxiety, and exacerbation of pre-treatment anxiety disorder. Untreated anxiety and depression can produce negative effects on patients' control of symptoms, ability to make treatment decisions, compliance with treatment, social interaction, and quality of life (Tel, Tel, & Doğan, 2011). Hence, diagnosis and treatment of anxiety and depression can considerably improve patients' physical and emotional functioning (Buzgova et al., 2015), substantially enhancing their

quality of life. To sum up, psychological wellbeing is an important aspect of quality of life for patients with severe diseases like breast cancer. Early diagnosis and treatment of psychological symptoms, such as anxiety and depression, and other psychiatric disorders will increase patients' adjustment to breast cancer and its treatment and, in turn, their quality of life. Therefore, initial assessment as well as subsequent treatment of depression and anxiety could be used to promote psychological health and quality of life among women with breast cancer.

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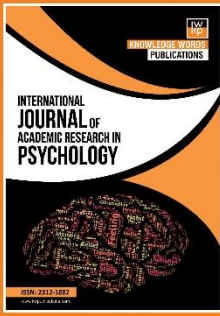
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## Differences of Mental Health among Orphan and Non-Orphan Adolescents

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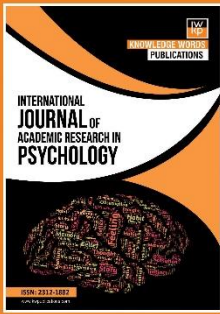
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## Differences of Mental Health among Orphan and Non-Orphan Adolescents

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### Abstract

The study aims to identify the differences of mental health among orphan and non-orphan adolescents in Malaysia. This study used a quantitative method. The sample comprised of 240 orphans and 240 non-orphan adolescents, aged 13 to 17 years old selected through multistage sampling. The validated Malay version of Depression, Anxiety, Stress Scale 21 Item (DASS21) used in this study to measure mental health among the orphan and non-orphan adolescents. The findings showed that there have differences of mental health among orphan and non-orphan adolescents which is orphans had significantly higher level of mental health problem than non-orphan respectively; depression, anxiety and stress. Result revealed that all parties including government organization, non-governmental organizations (NGOs), orphanage centers and guardians need to regulate actions such as program implementation and intervention to ensure the continuity of mental health especially among orphan adolescents in Malaysia.

**Keywords:** Mental Health, Depression, Anxiety, Stress, Orphan Adolescent, Non-Orphan Adolescent.

### Introduction

Mental health is an important element for childhood and adolescents health development (Greydanus & Merrick, 2012; Waddell *et al.*, 2007). Adolescents who have good mental health are able to recognize their own abilities, can handle normal stresses in life and able to contribute to the community (World Health Organization, 2012). However, there are psychological issues that contributed to the mental health disorders among adolescents nationwide (Mohammadzadeh *et al.*, 2017a; Chen *et al.*, 2017; Aud, Ramani & Frohlich, 2011; Suldo & Shaffer, 2008).

Based on reports from the World Health Organization (WHO), mental health disorders in children and adolescents have increased each year and this issue will continue to increase by 50% until 2020 (Bayera *et al.*, 2010). In 2015, the National Health and Morbidity Survey Statistics has been implemented by the Ministry of Health Malaysia (MOH), found that adolescents are among those

with the highest number of people experiencing mental health, especially aged 16 to 19 years of which 29.2% comprised 4.2 million people more than 31 million Malaysians (Ministry of Health, 2015).

However, mental health disorders are highest among orphan adolescents who living in orphanages. Previous studies showed that mental health disorders among orphans are higher than non-orphans adolescents (Mohammadzadeh *et al.*, 2017a; Hashim *et al.*, 2011; Kaur & Rani, 2016; Bhat, Rahman, & Bhat, 2015). Studies have shown adolescents who living in orphanages are exposed to various emotional disorders such as depression, anxiety and stress (Mohammadzadeh *et al.*, 2017a; Nurulwahida, Aizan & Khaliza, 2014; Lehman *et al.*, 2013). In Asia, there are 68.9 million orphans who shown the largest number in the world (Orphan Facts & Statistics, 2005). Based on statistics from the United Nations (UN), over 400 thousand children in Malaysia have been orphaned since 2015 and this number is expected to increase every year (Lakshiny, 2015). However, there are no detailed statistics stating the exact number of orphanage in Malaysia because as many unregistered with formal organizations (Mohammadzadeh *et al.*, 2017a).

According to the growing number of orphans, it seems that the orphanage are the primary choice for those who are unlucky to live with other relatives (Polihronakis, 2008; Nair, 2014). In Terengganu, orphan adolescents from all the district were centered at the Terengganu Orphan Welfare Organization (PERKAYA) which is this situation make a crowded number of orphan adolescents and gave a distress to guardians to control to all residents (PERKAYA, 2017). Orphans those living at the orphanages are seen to face that environment to continue their daily lives without enough attention from their guardians. Therefore, they are more likely to have various of emotional and behavioral problems such as depression, anxiety and stress which are totally different compared to non-orphan adolescents (PERKAYA, 2017).

Previous study showed that orphan adolescents suffered high emotional problem compared non-orphan adolescents at a school in Acera, Ghana (Yendork & Somhlaba, 2015). According to Cluver and Gardner (2006), orphan adolescents in Cape Town, South Africa experiencing mental health disorders such as depression and anxiety. Studies have shown orphan adolescents brought up in orphanages are exposed to various of emotional and behavioral problems such as depression, anxiety, stress and anti-social behavior (Lehmann *et al.*, 2013; McLaughlin, Zeanah, Fox, & Nelson, 2012; Fawzy & Fouad, 2010).

In 2017, a local study have found that orphans living in orphanage centers in Selangor suffer from depression, anxiety and stress (Mohammadzadeh *et al.*, 2017a). Another study in 2014 showed that orphan adolescents in Malaysia exposed to Major Depression Disorder (MDD) (Wan Salwina *et al.*, 2014) than non-orphan adolescents (Kaur *et al.*, 2014; Wahab *et al.*, 2013; Hashim *et al.*, 2011). More than 50% of orphans have mild to severe depression in Kelantan (Ramli *et al.*, 2010). Furthermore, according to Mohammadzadeh *et al.* (2017b) study also indicates that orphans have higher levels of stress compared to non-orphan adolescents (Yaacob *et al.*, 2009; Sulaiman *et al.*, 2009).

However, only a few local studies have examined the psychological well-being or conducted educational interventions among adolescents who living in orphanages (Mohammadzadeh *et al.*,



2017b; Syazrah et al., 2015; Nurulwahida, Aizan & Khaliza, 2014; Wan Salwina *et al.*, 2014; Ramli, Yahaya & Lazin, 2010; Roslee *et al.*, 2004). In addition, local researchers have not yet give the proper attention on studies among between group of adolescents; orphan and non-orphan. Local studies have focused on mental health among different samples such as school students (Norhayati, 2013; Hashim *et al.*, 2011) and IPT students (Shamzaeffa & Tan, 2016; Shamsuddin, *et al.*, 2013; Nurhaila, *et al.*, 2011). Therefore, information about mental health among orphan adolescents is very limited and the lack of information in this area become the major challenge to develop effective intervention and treatment programs among orphan adolescents in Malaysia. Hence, this current study is an effort to contribute information on mental health among orphan adolescents, which by identifying the different levels of mental health among orphan and non-orphan adolescents.

## **Methodology**

### **Sample and Procedure**

A total of 240 adolescents from one orphanage center and 240 non-orphan adolescents in a school in Terengganu, Malaysia, aged 13 to 17 year olds are involved in this descriptive study. The samples were selected using multi stage sampling. The orphan adolescents who has lost biological father and both parents were involved in this current study (the condition in the orphanage). Meanwhile, for those still have both parents and live together in category as non-orphan adolescents.

### **Research Instrument**

Data collection was carried out by administered validated Malay version of Depression, Anxiety, Stress Scale 21 Item (DASS21) to measure mental health among samples.

### **Depression, Anxiety, Stress Scale 21 Item (DASS21)**

Depression, Anxiety, Stress Scale version 21 Item (DASS21) is a modified questionnaire from the DASS version of the 42 questionnaire developed by Lovibond and Lovibond (1995). The translated DASS21 questionnaire has been used in this study to measure the level of depression, anxiety and stress with reliability (depression, 0.8; anxiety, 0.74 and stress 0.79) (Ramli *et al.*, 2007). The answer format for this questionnaire consists of four likert scale to describe the samples' condition throughout the week before answering the questionnaires from (0) Never, (1) Sometimes, (2) Often and (3) Almost Always.

### **Data Analysis**

In this study, the quantitative data obtained was processed and analyzed using the Statistical Package for Social Sciences (SPSS) for WINDOW version 23.0. Methods of inferential statistical analysis of Independent Sample t-Test were used to determine the differences of mental health (depression, anxiety and stress) among the samples.

### **Findings**

Based on the DASS21 questionnaire, the mental health level is measured based on the elements of depression, anxiety and stress. The findings show that there was a significant difference in the score of depression between orphan and non-orphan adolescents;  $t(478) = 6.27, p < .001$ . Thus, the results of the study showed that the level of depression of orphans was higher ( $m=2.38, Sd=0.85$ ) compared with non-orphan adolescents ( $m=1.89, Sd=0.85$ ). In addition, the results also showed that there was

a significant difference in the score of anxiety between orphan and non-orphan adolescents;  $t(478) = 5.03$ ,  $p < .001$ . The results showed that the level of anxiety among orphans was higher ( $m=3.44$ ,  $Sd=1.31$ ) compared to non-orphan adolescents ( $m=2.82$ ,  $Sd=1.37$ ). Moreover, there was also significant difference in the score of stress between orphan and non-orphan adolescents;  $t(478) = 2.15$ ,  $p < .05$ . The results showed that the level of the stress among orphans was higher ( $m=1.73$ ,  $Sd=0.89$ ) compared to non-orphan adolescents ( $m=1.57$ ,  $Sd=0.75$ ). The overall findings are shown in Table 1.

**Table 1.0 Differences of mental health among orphan and non-orphan adolescents**

Variable	Orphan Adolescents		Non-orphan adolescents		t	Sig
	Mean	Sd	Mean	Sd		
Depression	2.38	0.85	1.89	0.85	6.267	0.00
Anxiety	3.44	1.31	2.82	1.37	5.031	0.00
Stress	1.74	0.89	1.57	0.75	2.152	0.03

### Discussion and Conclusion

Mental health disorders such as depression, anxiety and stress among adolescent and early adult worldwide is currently estimated to range from 5 to 80% in different populations (Sahoo & Khess, 2010). Depression, anxiety and stress also are among major psychiatric conditions being prevalent in contemporary youth (Buzdar et al., 2015). However, previous studies have shown that adolescents living in orphanage centers suffer from mental health problems rather than non-orphan adolescents (Mohammadzadeh et al., 2017a; Hashim et al., 2011; Kaur & Rani, 2016; Bhat, Rahman, & Bhat, 2015).

The result of the current study, reported that orphans have emotional problems such as depression, anxiety and stress higher than non-orphan adolescents. This explained that orphan adolescents was experienced lower mental health. The results of previous studies in Malaysia also showed that orphans living in orphanage centers are more depressed (Mohammadzadeh et al., 2017a) and exposed to Major Depression Disorder (MDD) (Wan Salwina et al., 2014) compared to non-orphan adolescents (Hashim et al., 2011; Kaur et al., 2014). In addition, more than 50% of orphan adolescents have mild to severe depression (Ramli et al., 2010). The result of the current study have also shown consistent findings with previous studies which is orphans have experienced higher levels of anxiety and stress than non-orphan adolescents (Mohammadzadeh et al., 2017a; Wahab et al., 2013; Yaacob et al., 2009; Sulaiman, Hassan, Sopian, Vizata, & Saifuddin, 2009).

Besides, oversea studies revealed that orphans adolescents have experienced high depression (Kaur & Rani, 2016; Workye, 2015; Bhat et al., 2015; Bhat, 2014) and exposed to behavioral problems such as aggressive and anti-social behavior (Lehmann et al., 2013; Simsek et al., 2007) compared to adolescents who still have both parents (Akshita Singh & Suvidha, 2016; Irshad, 2015; Kumar et al.,

2014; Wild *et al.*, 2006). The difference of negative events experienced by orphan adolescents has caused them suffering mental health disorders such as depression, anxiety and stress (Elegbeleye, 2014; Sujatha & Jacob, 2014; Fawzy & Fouad, 2010; Thabet *et al.*, 2007) compared to non-orphan adolescents (Dorsey *et al.*, 2015; Afework, 2013; Nyamukapa *et al.*, 2010; Kaggwa & Hindin, 2010; Olley, 2008).

The negative event such as lost of parents at an early age, has caused orphan adolescents lost of parental attachment in their lives. Living in orphanages, deprived orphan adolescents from their parents attention and loves. They faced the different environment before the death of their parents (Irudayasamy, 2006). Negative outcomes are very common among orphan adolescents due to poor care-giving from guardian at orphanages (Thabet *et al.*, 2007). These situation influenced orphan adolescents to experience emotional disorders such as depression, anxiety and stress (Deutsch *et al.*, 2015; Dorsey *et al.*, 2015; Afework, 2013) compared with non-orphans adolescents who still have the opportunity to get attention, love and affection from their parents (Hashim *et al.*, 2011; Harms *et al.*, 2009).

In conclusion, the purpose of this study was to identify the difference in mental health among orphan and non-orphans in Terengganu, Malaysia. The findings of this study were in agreement with the majority of previous studies that confirmed the differences of mental health among orphan and non-orphans adolescents. The information obtained from this current study provide benefits and implications to various parties such as the State Social Welfare Department (JKM), non-governmental organizations (NGOs), parties in the orphanage care centers, teachers and other parties involved in the management of orphanages especially in Terengganu, Malaysia.

Unfortunately, there is not much reliable data and information of mental health among orphan adolescents from various categories such as “maternal orphan” (a child who has lost her/his mother), “paternal orphan” (a child who has lost her/his father), and lost both parents living in orphanage in Malaysia. Since this current study only examines orphan adolescents from “paternal orphan” (a child who has lost her/his father) and lost both parents categories, this situation makes it a major limitation to be taken by future researchers to ensure the continuity of mental health among orphan adolescents, especially in Malaysia. Further studies with different orphans in all orphanage centers in Malaysia, different ages and races as well as to use different tools are suggested to reach a reliable image of mental health among orphan adolescents Malaysia with more thoroughly and comprehensively.

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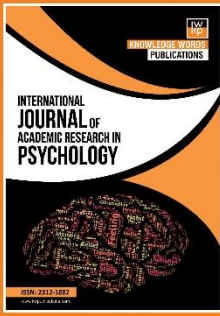
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# INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PSYCHOLOGY



## A Brief Review on Embodied Language Comprehension

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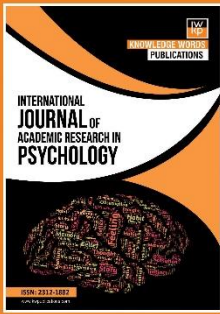
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# INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PSYCHOLOGY



## A Brief Review on Embodied Language Comprehension

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### Abstract

Recently, a growing body of research in psychology, psycho-linguistics and neuroscience has posed a challenge to the traditional view of language comprehension by proposing that cognitive states are not disembodied in language comprehension. Embodied theories of cognition hold that the actual mechanisms underlying language comprehension is hypothesized to entail performing mental simulations of its content. Numerous empirical researches have emerged in support of embodied view of language comprehension. While nowadays there is no single view of embodied cognition, its theories share many characteristics and assumptions (Wilson, 2002) and one of the most influential is Barsalou's (1999) Perceptual Symbol System, which proposes that people activate and manipulate perceptual symbols during language comprehension even when the perceptual characteristics are merely implied rather than explicitly stated. The purpose of this paper is to provide a systematic review of how sensory-motor and affective processes contribute to language comprehension.

**Keywords:** Embodied Theories, Language Comprehension, Perceptual Symbol System.

### Introduction

Recently, a growing body of research in psychology, psycholinguistics and neuroscience has posed a challenge to the traditional view of language comprehension --- the Amodal Symbol Model, by proposing that cognitive states are not disembodied in language comprehension. Traditionally, language comprehension was supposed to be that linguistic inputs were mapped to semantic or conceptual representations. To understand an utterance, the language user maps words onto the semantic symbols that represent their meaning, and then are aligned as dictated by the sentence. Nonetheless advocates of current embodied cognition argue that language comprehension in essential reuses the conceptual and linguistic representations embedded in perceiving or acting, to be specific, it is a matter of reusing sensory-motor system. Accumulating behavioral and neuroscience evidence support the embodied view from research on language processing (Barsalou, 1999; Glenberg & Kaschak, 2002; Kan et al., 2003; Gallese, 2008; Pecher & Zwaan, 2005; Pulvermuller, 2008; Thompson-Schill, 2003). While nowadays there is no single view of embodied cognition, its theories share many characteristics and assumptions (Wilson, 2002) and one of the most influential is

Barsalou's (1999) Perceptual Symbol System. Barsalou proposed that perceptual representations are the building blocks of cognition. Perceptual symbols or representations are the residues of a perceptual experience, stored in the brain and routinely activated in the course of language comprehension. Unlike amodal propositions, perceptual symbols bear an analog rather than arbitrary relationship with the referents. According to Perceptual Symbol System, the actual mechanisms underlying language comprehension is hypothesized to entail performing mental simulations of its content (Narayanan 1997; Barsalou 1999; Glenberg & Robertson 2000; Bergen et al. 2004; Bergen & Chang 2005). The purpose of this paper is to provide a systematic review of how sensory-motor and affective processes contribute to language comprehension.

### **The Traditional View of Language Comprehension**

A classic debate in cognitive psychology and cognitive science has concerned how the information is stored and manipulated in the human brain. The historically prevalent theory of knowledge representation in cognitive science has been the amodal or (propositional) symbol system (e.g. Fodor, 1975; Kintsch, 1998; Newell & Simon, 1972; Pylyshyn, 1981, 1984). Recently, however, researchers have posed a potentially viable alternative to amodal system in the form of perceptual symbol system (Barsalou, 1999), an embodied view of language comprehension. To clarify the embodied view of language comprehension, it is beneficial to contrast it with the traditional view in language comprehension.

As Gibbs (2006) puts it, the traditional belief of language comprehension is that meaning is an abstract entity divorced from bodily experience. Understanding language is assumed to require breaking down the physical information (e.g. speech sounds) into a language-independent medium that constitutes the "language of thought". The traditional view has been confirmed across different disciplines: in AI (Schank, 1972), in linguistics (Jackendoff, 1983, 1997, 2002), in psychology (Kintsch, 1998; Levelt, 1989; Miller & Johnson-Laird, 1976), and in philosophy (Fodor, 1975; Latz, 1972; Katz & Fodor, 1963). The most representative traditional view of language comprehension is the Amodal Symbol Model.

### **Amodal Symbol Model**

The Amodal Symbol Model, emerging from the Cognitive Revolution in the 1950s remained dominant for over five decades in the area of language comprehension. The core assumption of the Amodal Symbol Model is that meanings of words and sentences are like a formal language, composed of abstract, amodal and arbitrary symbols, which stand for aspects of the word. (Burgess & Lund, 1997; Chomsky, 1980; Fordor, 2000; Kintsch, 1998; Pinker, 1994). Take the word "banana" for example, word is abstract in that it refers to unripe green banana and ripe yellow banana, word is amodal in that the same word is used when banana is spoken about or written about, and word is arbitrarily related to the referents in that the phonemic and orthographic characteristics bear no relationship to the physical or functional characteristics of the word's referent. To understand it requires processing those amodal features of banana [fruit], [long], [curved], [yellow], [peel] etc., not retrieving the memory or experience of how it is typically perceived and used.

From this perspective, the mind is an abstract information processor and sensory-motor system are not related to high-level cognitive processes, like memory and language comprehension (Fodor, 1975; Newell & Simon, 1976; Pylyshyn, 1984). Language comprehension was supposed to be that



linguistic inputs were mapped to semantic or conceptual representations. To understand an utterance, the language user maps words onto the semantic symbols that represent their meaning, and then are aligned as dictated by the sentence. Semantic representations are fully symbolic and there is an arbitrary relationship between the word and the referent. The conceptual system, which is believed itself to be made up of such abstract, amodal symbols, is consequently updated on the basis of the new information that has just been entered into the system. The content of the utterance is understood and the semantic information is completely independent from sensory-motor system.

The Amodal Symbol Model was corroborated by several symbolic models describing how human memory is organized semantically and schematically (Bobrow & Norman, 1975; Chariniak, 1978; Norman, 1975; Quillian, 1969; Rumelhart, 1975; Shank & Abelson, 1995; Smith, Shoben & Rips, 1974) as well as computational implementations, such as Knowledge Representation Language (Bobrow & Winograd, 1977), Hyperspace Analog to Language (Lund & BURGESS, 1996), Topic Model (Griffiths & Steyvers, 2004), and Latent Semantic Analysis (LSA) of Landauer and Dumais, 1997). Furthermore, the demonstrations of the most popular model, such as LSA, in picking out synonyms, measuring coherence of texts (Landauer and Dumais, 1997), and even scoring students' essay (Landauer, Laham, Rehder, & Schreiner, 1997) led some scholars to support the potential of this model to account for human meaning (Landauer, 2002; Louwerse & Ventura, 2005).

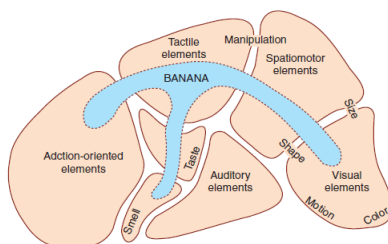
Nonetheless, the dominance of Amodal Symbol Model recently has been challenged by the embodied view of language comprehension, which proposes that language comprehension is grounded in mental representations of perceptual, motor and affective experiences of the world.

### The Embodied View of Language Comprehension

Prior to the prevalent Amodal Symbol Model, however, ancient philosophers such as Epicurus (341-270 BC), on the contrary, proposed that concepts are rooted in modality-specific representations. This philosophical approach was resurrected in the 1990s and aroused scholars' interest ever since. It is the so called Perceptual Symbol System or Embodied Cognition or Simulation Model. The core proposal is that concepts are anchored in modality-specific system and language comprehension involves activating high-level perceptual and motor representations (Barsalou, 1999, 2008, Pecher & Zwaan, 2005; Gibbs, 2006; Semin & Smith, 2008; Shapiro, 2010).

Take the banana for example as well, understanding the object noun is supposed to involve activating modality-specific records in long term memory about how the banana looks, how it tastes, and how it is manipulated, etc. (Figure 1)

Figure 1. An illustration of Perceptual Symbol System, concepts are anchored in modality-specific system for perception and action (Based on a figure from Thompson-Schill et al., 2006, which itself was based on a figure from Allport, 1985.)



According to the Perceptual Symbol System, it is plausible that process a sentence, particularly a sentence involving an observable physical event, may often cause us to image the event being described.

There are three possible positions --- strong, moderate and weak in embodied vie of language comprehension that deal with the

relationship between enactive simulation and linguistic understanding. They are:

Strong embodied view of language comprehension (ELCs): Linguistic understanding just is an enactive simulation process;

Moderate embodied view of language comprehension (ELCm): linguistic understanding requires, but is not identified with, enactive simulation;

Weak embodied view of language comprehension (ELCw): linguistic understanding can use, but does not require, enactive simulation.

### **Perceptual Symbol System**

In the past decade, numerous research in psychology, neuroscience and cognitive linguistics has grown exponentially, providing profound evidence for the embodied view of language processing (Barsalou, 1999; Boulenger et al., 2008; Borghi, 2004; Bub and Masson, 2010; de Vaga, 2008; Glenberg & Kaschak, 2002; Pecher & Zwaan, 2005; Pecher, Zeelenberg and Barsalou, 2003; Zwaan and Taylor, 2006). While nowadays there is no single view of embodied cognition, and one of the most influential is Barsalou's (1999) Perceptual Symbol Systems.

Barsalou argued that perceptual representations rather than the amodal propositions are the building blocks of cognition. Perceptual symbols are the residues of a perceptual experience, stored as patterns of activation in the brain. Because our attention is limited, perceptual symbols are typically schematic, rather than being like high-resolution video clips or high-fidelity sound clips. However, unlike amodal propositions, perceptual symbols bear an analog relationship with the referents. Barsalou assumed that perceptual symbols are used in perceptual simulations that make up human cognitive processes

In the cognitive psychology and cognitive linguistics domain, this activation of brain systems dedicated to perception or action has been interpreted as reflecting *mental simulation* of the content of the sentence on the part of the individual (Glenberg & Kaschak, 2002; Zwaan, Stanfield & Yaxley, 2002; Richardson et al., 2003; Bergen et al., 2007, Mahon & Caramazza, 2008). Mental simulation is the internal enactment or reenactment of perceptual, motor or affective experiences (Barsalou, 1999). Mental simulation may be static or dynamic, and this term also called mental imagery in the literature. In the neuroscience, mental simulation is produced by brain structures specific to the relevant modality; motor simulation uses motor areas, down to the specific regions that control simulated effectors. Similarly, visual simulation is produced through activation of visual areas. It is noteworthy that while the perceptual and motor content of mental simulations can often be made accessible to conscious introspection, mental simulation constructed during language comprehension is immediate, automatic, and entirely unconscious (Barsalou, 1999). Perceptual Symbol System proposes that our knowledge about the world is developed not in a holistic but a categorical way because our attentions system focuses on components of experience in the context of possible interactions with the world. The continuous experience with the world, in turn, leads to gradual integration of perceptual symbols into a distributed multi-modal system that represents the category as a whole - a simulator (Barsalou, 2009). Thus we develop various kinds of perceptual simulator (visual, motor, emotional, etc.) and later get integrated with simulator for the words they refer to. Under this account, it is quite easy to distinguish between the color of a bear in the wood and the color of a bear in the polar and to discriminate between a sound of voice in a cave and a sound of voice in a room. In sum, it is the interaction between language, body and environment that

makes it possible for humans to make inferences about information implied by the sentence.

### **The Behavioral Research on Perceptual Symbol System**

There is ample evidence on perceptual symbol system that people routinely perform perceptual simulation implied by the sentence during language comprehension. There are three major compatibility effect providing support for the embodied view of language comprehension: appearance, affordance, and action compatibility effect (the ACEs). Appearance compatibility effect is the methodology mainly adopted in the studies on perceptual symbol system. The rationale is a sentence-picture mapping: after reading or listening a sentence, an image of the object that either integratable or not integratable with the sentence presented, the task for the participants is to judge whether the object was mentioned in the proceeding sentence.

In a study by Standfield & Zwaan (2001), they asked participants to read a sentence implying the orientation of an object either vertical or horizontal (e.g. "Mary hammered the nail into the floor" or "Mary hammered the nail into the wall"), each followed an image of object either match or mismatch the the orientation implied by the sentence, then participants judge whether the object was mentioned in the proceeding sentences by pressing a key labeled "Yes" or "No" on the computer. The findings are that there is a significant differences on the response latency between in the matched condition and in the mismatched condition. Participants were faster to respond to the image stimuli when matched the orientation implied by the sentence rather than mismatched. The findings suggest that people mentally represent the orientation of an object implied by the sentence.

A similar appearance compatibility effect was found in related studies of Zwaan, Standfield, and Yaxley (2002) on the simulation of object's shape. Participants read sentence describing an object with different shape (e.g. "The ranger saw the eagle in the sky" or "The ranger saw the eagle in the nest"). Then they saw an image matched or mismatched the shape of the object implied by the sentence. When the image matched the shape in the described scenario, participants are faster to respond.

The appearance compatibility effect also confirmed with the dynamic stimuli of object motion. Zwaan, Madden, Yaxley and Aveyard (2004) instructed participants to read sentences implying an object's motion towards or away from them (e.g. "You throw the ball to John" or "John throws the ball to you"), then presented two slides of an object in a sequence that makes it appear as if the object is coming closer or moving farther away. Participants are faster to that the same object in each slide when the direction of motion depicted agrees with the direction that the object would be moving in the scenario described by the sentence. A similar Match advantage was also found by Yaxley and Zwaan (2007) in related study on the simulation of visibility (e.g. "Through the fogged goggles, the skier could hardly identify the moose" or "Through the clean goggles, the skier could hardly identify the moose" )

Finally, in the most recent studies Zwaan and Pecher (2012) replicated and Engelen, Bouwmeester, de Bruin, and Zwaan (2011) extended the study of Standfield and Zwaan (2001); Zwaan, Standfield, and Yaxley (2002). Despite the research conducted by Louise Connell (2007) addressed a different claim to previous studies on perceptual symbol system that there was a mismatch advantage during language comprehension. He argued that color, the *secondary* object property is represented distinct from *primary* object properties, like shape, orientation and motion. He suggested that perceptual color perceptual information is activated during language

comprehension even doing so does not facilitate task performance: participants respond more quickly when the color of a pictured object mismatched the color implied by the previous sentence. Obviously all these behavioral evidence provides a support for the assumption of Perceptual Symbol System that language comprehension involves constructing sensory-motor simulations of a described scenario.

### **The Neuroscientific Research on Perceptual Symbol System**

In spite of the behavioral evidence on Perceptual Symbol System, neuroscientific research provides substantial support for the idea that the same sensory-motor regions of the brain get activated during language comprehension (Eskenazi et al., 2009; Gallese, 2008; Kan et al., 2003; Martin, 2001, 2007; Pulvermuller, 2008; Thompson-Schill, 2003). Since the early 1990s, an increasing number of research has applied various brain mapping techniques to investigate predictions about the degree to which language processing reuses modality-specific systems for perception and action. In what follows, we consider major findings of these research, with special reference to several kinds of semantic features which enter into the meaning of concrete nouns. Consider the Perceptual Symbol System, what we studied in present study, we mainly review three types of visual features -- color, shape and motion.

### **Color Features**

Many kinds of objects have “typical” and “canonical” colors. It goes for numerous artifacts, whose colors are determined by social conventions (e.g., yellow taxis) and even more strongly to diverse categories of animals (e.g., white geese) and plant (e.g., red strawberries). Such object-color associations plays a critical part of people’s semantic knowledge of the relevant nouns.

With regard to the brain, although color perception is mediated by many neural mechanisms which begin in the retina, two main cortical regions are particularly significant. First, passive color sensation, which takes place when a person simply gazed at flowers in the garden, depends on area V4, a patch of cortex resides in the lingual gyrus of the occipital lobe. Functional neuroimaging research has shown that this area is engaged more when people perceive colored stimuli than when they perceive grayscale equivalents (Zeki et al., 1991; Kleinschmidt et al., 1996; Hadjikhani et al., 1998). Moreover, neuropsychological research has indicated that damage to area V4 leads to achromatopsia, which is an impairment of the capacity to consciously view color (Zeki, 1990; Bouvier & Engel, 2006). Second, active color sensation, which takes place when a person attentively, deliberately compares the shades of different colors, relies on the area V4, the middle sector of the fusiform gyrus, which is a part of the ventral temporal cortex. The fusiform gyrus constitutes much of the so called “what” pathway, that is the branch of visual processing hierarchy that deals with shape, color and texture properties of objects. The area V4 in the region of fusiform gyrus become active during color discrimination.

Whether the two main color perception areas --- V4 and V4a --- engaged when a person retrieves semantic knowledge about the color features of object encoded by nouns like taxis, geese, and strawberries? To solve this question, Simmons et al. (2007) conducted an fMRI study. The fMRI data showed that these dual criteria were satisfied by a large cluster of voxels in the left mid-fusiform gyrus, most likely overlapping V4a, which conforms to the Perceptual Symbol System, since it suggests that semantic knowledge is anchored in the brain’s modality-specific systems. Nonetheless,

opponents of the Perceptual Symbol System argued that fusiform activity observed in the color property judgments may not reflect the unconscious, implicit retrieval of conceptual color features per se, instead reflect the conscious, explicit generation of color imagery, a process that may occur after the relevant color knowledge has been accessed from a purely abstract semantic system located elsewhere in the brain. To further address the question, Simmons et al (2007) invoke some relevant neuropsychological data. They found that damage to the left fusiform can lead to color agnosia, a disorder that impairs knowledge of the sorts of canonical object-color associations. This finding certainly bolsters previous fMRI study that the fusiform activity reflects the retrieval of conceptual color features, as opposed to only color imagery.

### **Shape Features**

Overall, the most critical visual-semantic component of object nouns is shape (Vinson & Vigliocco, 2008; Gainotti et al., 2009, 2013; Hoffman & Ralph, 2013). Numerous research with diverse brain techniques proved that like color properties, the shape properties of visual objects are also represented in the ventral occipital temporal cortex. As the researchers put it, distinct regions of the fusiform gyrus were activated not only by images but also by words, which fit the prediction of the Perceptual Symbol System.

The convergent results of the research by Chao et al. (1999) and Wheatley et al. (2005) confirmed that the shape features of the meaning of the object nouns are captured by neurons in the ventral temporal cortex not only overlapping partially with those facilitates visual perception of the very same features, but also segregating according to semantic category. Further evidence in favor of the idea comes from fMRI research (Kan et al., 2003; Devlin et al., 2005; Mechelli et al., 2006; Noppeney et al., 2006; Mahon et al., 2007; Chouinard & Goodale, 2010; Peelen et al., 2013; Tyler et al., 2013). Moreover, neuropsychological research has conformed to the Perceptual Symbol System that damage to the mid-fusiform gyrus, especially in the left hemisphere, frequently impairs the understanding of concrete object nouns (Gainotti, 2006; Capitani et al., 2009).

### **Motion Features**

Another important visual-semantic component of object nouns is the characteristic motion patterns of the designated entities. For example, part of the meaning of rabbit is the typical hopping movement of this kind of animal, and part of the meaning of scissors is the idiosyncratic cutting movement of this kind of tool. Numerous research has conformed that area MT<sub>+</sub> located in the vicinity of the anterior occipital and lateral occipital sulci is activated in the passive perception of moving visual stimuli. Damage to this area can lead to akinetopsia, that is acquired motion blindness, an impaired ability to consciously see motion. There are two parallel motion processing pathways: pSTS (the pathway extends from MT<sub>+</sub> into a sector of the posterior superior temporal sulcus) responds to the sight of biological (e.g. animal) motion patterns and pMTG (the pathway extends from MT<sub>+</sub> into a sector of the posterior middle temporal gyrus) responds to the sight of nonbiological (e.g. tool) motion patterns (Beauchamp & Martin, 2007, Saygin, 2012). Consistent with the prediction of Grounded Cognition Model, evidence from the fMRI study suggested that two motion processing pathway, pSTS and pMTG contribute not only to the high-level perception, but also to the long-term semantic representation of category-specific object-motion associated patterns.

To sum up, the studies reviewed above well supports the prediction of the Perceptual Symbol



System that the meanings of object nouns are anchored in modality-specific brain systems, thereby language comprehension involves activating perceptual and motor representations that. According to Perceptual Symbol System, object concepts are not representations stored in an autonomous semantic module, whereas they consist of multiple fragments of information, which are widely distributed across the cerebral cortex in a manner dictated by the content. Thus color features stored in the same part of ventral temporal cortex that underlie high-level color perception; shape features stored in the same part of ventral temporal cortex that underlie high-level shape perception; motion features stored in the same part of lateral temporal cortex that underlie high-level motion perception. This interpretation of conceptual knowledge suggests that when processing an object noun with complex multimodal features, for example, an animal word like “bear”, the corresponding complex network of multimodal cortical area is rapidly and unconsciously engaged. Indeed, the Perceptual Symbol System proposes that it is precisely the activation of perceptual and motor representations that constitutes a critical part in language comprehension.

### **Another two Prevalent Models in Strong Embodied Language Comprehension**

Perceptual Symbol System, a strong embodied view of language comprehension, which suggests that human cognition is completely grounded in sensory-motor systems and language comprehension involves activating high-level perceptual and motor representations. To our knowledge, alongside Perceptual Symbol Theory of Barsalou (1999), there are another three strong embodied theories currently arouse hot debates on language processing, namely Indexical Hypothesis of Glenberg and Robertson (1999, 2000) and Immersed Experienced Framework of Zwaan (2004).

Indexical Hypothesis (IH) of Glenberg and Robertson (1999, 2000) is another theory of strong embodied view of language comprehension that further develops the Perceptual Symbol System of Barsalou (1999). IH focuses on specifying the perceptual symbols related to action, especially the function of action in language comprehension. It was motivated by Glenberg’s (1997) assumption that a situation becomes meaningful relying on the set of actions available to a particular person in a particular situation.

(IH): The first step in language comprehension is to index words and phrases to objects, analogical representations of the objects such as images, or to perceptual symbols (Barsalou, 1999; Stanfield & Zwaan, 2001). Unlike abstract symbols, perceptual symbols are modal and non-arbitrary based on the perception of the referents. The second step is to derive affordances from the perceptual symbols (Glenberg & Robertson, 2000; Kaschak & Glenberg, 2000). Unlike the arbitrary symbols, new affordance can derive from the perceptual symbols because perceptual symbols are not arbitrarily related to the referents. The third step is to mesh those affordances under the guidance of syntactic constructions (Kaschak & Glenberg, 2000).

Immersed experienced framework (IEF) of Zwaan is another theory of language comprehension in Embodied Cognition. It is a comprehensive theory of how embodied processes might work during language comprehension.

(IEF): Language is a set of cues to the comprehender to construct an experiential (perception plus action) simulation of the described situation. In this conceptualization, the comprehender is an immersed experiencer of the described situation, and comprehension is the vicarious experience of the described situation. The IEF puts forward that there are three major processes during language

comprehension: activation, construal, and integration. During activation, target words activate the functional webs, the various original experience with the referent in different visuospatial configurations such as shape, orientation, color, motion, etc. During construal functional webs are integrated in simulation of the event implied by the language. Finally, integration refers to experientially-based transitions from one construal to another. And successful integrations are influenced by personal experience, amount of overlap (refers to how much of current mental simulation has the same components of construal as the previous simulation), predictability (anticipation of next event), and linguistics cues (tense, word order, grammatical markers, etc.)

## Conclusion

To sum up, by contrasting the traditional and embodied view of language comprehension, we conclude that embodied language comprehension assumes an analogue relationship between a symbol and its referent, whereas Amodal Symbol System assumes an arbitrary relationship between a symbol and its referent. According to Perceptual Symbol System the complete representation of an object, called mental simulation, should reflect physical characteristics of the object. Amodal Symbol System, in contrast do not make this prediction. And in the past decade accumulating research in cognitive psychology and neuroscience have confirmed the embodied view of language comprehension, especially the Perceptual Symbol System from the perspective of object properties such as shape, orientation and motion. Actually there is substantial support from both behavioral and brain imaging research in favor of the notion that language comprehension is on the basis of unconscious and automatic internal recreation of previous, embodied experiences, using brain structures dedicated to perception and action. Undoubtedly there will be hot debates about the importance of symbolic representation and embodied representations in language comprehension. However, in the light of the previous research, it is possible that we overestimate the role of embodied factor or enactive simulation in language comprehension. Regarding to this issue, the research in the domain of embodied cognition will focus on providing compelling evidence for the role of simulation in deeper language comprehension in the future. And recently computational modeling has achieved research on this topics, which could provide a firmer theoretical support for the embodied approach to language comprehension.

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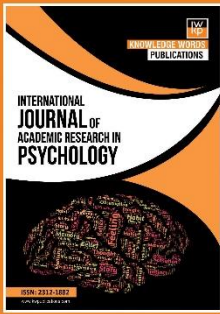
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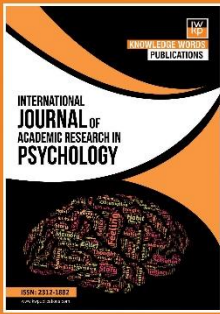
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## Effectiveness of Training Sensory Stimulation on Gross Motor Skills of 5-7 Years Old Children with Down Syndrome

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### Abstract

**Background:** Down syndrome is the most common congenital chromosomal disorders. This disorder is the most common genetically cause of mental retardation. This study examined the effectiveness of the training activities of sensory - motor (sensory stimulation) on gross motor skills in children 5 to 7 year-old with Down syndrome. In this study, participant consisted from children aged 5 to 7 years old who were members of Iranian Down syndrome society. The aim of investigation was the effectiveness of sensory – motor influence (sensory stimulation) on gross motor skills in children 5 to 7 year old with Down syndrome.

**Materials and Methods:** The present study had an experimental design and a pre test, post test plan with control group were used. For this purpose 24 children (aged 5-7 years old) were choose randomly from the Down Syndrome Association. Subjects were divided in two groups (experimental and control each 12 children) randomly. Treatment sessions were 16 with duration of 35 minutes Under the influence of sensory stimulation therapy (activities of sensory - motor).The control group didn't receive any intervention The research instrument was used in this study was Lincoln Oseretsky motor development Scale. The collected data were analyzed by covariance.

**Results:** Results showed that there was a significant relationship between the training of sensory stimulation and gross motor skill development in children with Down syndrome. ( $P < 0.001$ )

**Conclusion:** Sensory stimulation and early education of children with Down syndrome by motor abilities will make them self-efficacy and independent.

**Keywords:** Sensory Stimulation, Gross Motor Skills, Down Syndrome.

## Introduction

Down's syndrome is the most common congenital chromosomal disorder that is always with mental retardation (1, 2). The statistical analyses in different countries show that the incidence of this disorder is 1 in 700 to 1 in 900 per live birth(3, 4). This incidence percentage increases with the increment of pregnant age. With considering the total number of people with mental retardation within 5 to 6 percent, Down's syndrome is the most prevailing form of mental retardation (3, 4) the rate of mental retardation for people with Down's syndrome is so different, but the evidence suggests that most of these people are being classified into the mild mental retardation category(5,1) . On the one hand, children with Down's syndrome gross motor skills shape with delay and ineffectiveness as the mentioned children have got the following problems: Weak muscular tone, muscular flaccidity, weak bilateralism coordination, dyspraxia, the delay in physical developmental route, the shortness of bones in limbs, the tardiness in reflexes growth and their completion, the lateness in the growth of positional reactions, the specific anatomical - physiological traits of hand ( the shortness of hand length, having 23 bones instead of 27, low range of motion of joints, the shortness of fingers, abnormal lines and arches in palms, and the delay in grasping activities), the decrease in awareness of inputs and the enervation in tactile discrimination, stereognosis and the manipulation of objects(1, 5, 6).

On the other hand, these children display sensible deficiencies that result in the restriction in sensory experience and difficulty in normal motor control (7).

Sensory stimulations include different resources and qualities of energy that cause the act potential in related receptors to various senses such as auditory, visual, tactile, and vestibular; and finally individuals become aware of the stimulation of receptor organ through brain and show suitable reaction to that (5, 8, 9). Or rather the sensory integration treatment 'in general' and sensory stimulations in particular' include controllable sensory motivations that mostly involve self-governing activities that generates adaptive response and the integration of proprioceptive, tactile, and vestibular inputs that engenders the improvement in motor and behavioral responses(10, 11).

It's worth mentioning children with Down's syndrome have so many problems in development of motor skills, and considering the importance of motor skills in keeping the child's independence and the expansion of the other skills such as self-helping, play educational skills, and in general person's adaptation with environment, the development of gross motor skills is considered an important and remarkable issue in the improvement of these children's function and growth (11).

Regarding the high incidence of Down's syndrome and the awareness of the capability of suitable response to the rehabilitation plans ( Due to having apt developmental potentials) giving attention to these children and fine planning are indispensable needs for promoting the condition of their social, mental, and physical health.

As in so many researches the existence of processing problems and sensory integration in these children has appeared and its influence has been proved on the field of motor development.

Hernandez and et al, Zimmer and et al, Deli and et al, and Wang, J in various investigations have verified effectiveness of the following treatment plans: The effect of gross motor skills on the boy pupils' attention process with Down's syndrome, the influence of the sensory integration treatment on fine and gross motor skills in 5-7 year old children with Down's syndrome, efficacy of proprioceptive and simultaneous motivations over 6-7 year old children's dexterity with this syndrome, the influence of sensory integration method and training motor- perception skills on

motor problems of dyslexic children, the investigation of the influence of sensory stimulations and motor exercises on hand skills in mentally-retarded children, learning of gross motor activities in adolescents with Down's, the effectiveness of sensory integration treatment, the combination of sensory integration method with vestibular motivations(3, 5, 7, 9, 12-19).

On the one hand Since the existence of processing problems and sensory integration in children with Down's syndrome and its influence on the motor development is an obvious matter; and on the other hand as therapists have access to effective treatment approaches for obviating these setbacks; the enough research in relation to the influence of this treatment method has not been done

On children's motor development with Down's

While the scrutiny of the usefulness of sensory stimulation remedy in different disorders needs numerous surveys.

With giving attention to the importance of motor skills in the preservation of the child's independence, the development of motor skills in children with Down's syndrome should be taken into account; therefore this study was done with the aim of surveying the influence of sensory stimulation treatment training on 5-7 year old children's gross motor activities with Down's syndrome.

Here it should be told that the resulted outcomes of this research in the effectiveness direction of sensory motivations could open a new window on the horizon of rehabilitation and motor independence in children with Down's syndrome for specialists, therapists, and even children's parents.

### **Materials and Methods**

The present research was done in the frame of a quasi-experimental design with pre-test, post-test along with the control group. Two subject and control groups participated in this research, and pre-test and post-test were implemented on each of two groups.

The statistical society of the research included all of the 5-7 year old children with Down's syndrome who had referred to the rehabilitation center of Rezvaan and the association of Down's syndrome in 89-90 of the Iranian calendar.

Out of 43 children with Down's syndrome whose parents had consent to their participation in the research; and in terms of entrance and exit conditions, only 24 of them ( males) with Down's syndrome were chosen and divided into 12-individual two groups ( Subject and Control) through the random method.

After choosing the samples and specifying the mentioned groups, Lincoln-Ozeretsky Development Test was performed over them.

The observed entrance and exit conditions in selecting children were as follows:

The entrance criteria:

The contraction to Down's syndrome, having 5-7 years old, being male, not using of the sensory stimulation treatment during the survey period or before that( except the therapist's intervention in intermediation group), being volunteer and having the parents' consent for the children's participation in the research.

The exit criteria:

The existence of the severe and profound mental delay, severe convulsion, tough orthopedic disorders, the child's contraction to a debilitating disease during the intervention period provided

that the urgent hospitalization or surgery operation will be needed, the nonparticipation in the intervention sessions for 3 consecutive times or more.

## **Tool**

### **Lincoln-Ozeretsky's Motor Development Scale**

This tool is a set of standard tests including 36 sub-tests with the scoring from 0 to 3 and has been designed for assessing children's motor ability within 5-14 years old.

This scale is being performed individually and evaluates and meters different motor skills like fingers ability, the coordination of eye-hand, and the activity of large muscles of hands, arms, feet, and trunk.

This scale is a motor index that consists of fine and gross movements and has 6 sub-scales.

These six sub-scales contain the general static co-ordination, the total dynamic co-ordination. The dynamic hand co-ordination, motor agility, voluntary simultaneous movements, and motor inconsistency.

The splitting method has been used for the investigation of the reliability of the test, and the reliability coefficient has been calculated 97% by Spearman-Brown formula. The reliability coefficient with the splitting method has yielded 94% for this research.

## **Therapeutic Interventions**

After the necessary co-ordinations, Lincoln-Ozeretsky motor development test was performed during three sessions among children. The identified children after the performance of Lincoln-Ozeretsky Test were divided into two groups (Subject and Control) that children had been assimilated in terms of the age and the scores of motor development test. The control group did not receive any intervention and only kept the track of the usual trainings. But the subject group enjoy the needed instructions for 4 gross motor activities and its sub-skills during 16 sessions (With pre-test and post-test) for 2 months, weekly 2 sessions in 35 minutes. After finishing the educational sessions Lincoln-Ozeretsky motor development test was applied for both of two groups, and in the last stage the garnered data of subjects was analyzed through SPSS Software and multifactor covariance analyses test (MANCOVA).

### **Training in Static Vestibular Position: (4-6 sessions)**

The vestibular exercises consist of relatively static position while arms, knees, and head are put in contact with the mat. In general, these activities have become ancillary with the help of different kinds of imaginations and embodiments. For example, it is suggested to the child to make a bridge over the river through his body. In the next stage, the child is asked to create the mentioned bridge with three parts of his body while one of them is the wrist, or he uses two parts of his body whereas one of them is his knee.

### **Training in Dynamic Vestibular Position: (6-8 sessions)**

Here the vestibular balance board is placed up the surface of ground for walking and gets narrower, or another option is that the various objects with different heights are laid over the balance board to test the child's ability in passing over them, or some barriers are located up the wood and the child is forced to cross under them.



**Training Rapid and Agile Movements: (8-10 sessions)**

The given rapid movements to children include the movements in which the involvement of hands and feet are seen, and those in which the body movements are in the directions of up, down, forth, and back.

**Training Rapid Movement and Along with Motion: (10-13 sessions)**

They consist of the kinetic skills in the child's motor plan. Gamboling, jumping, and running were the problematic changes. As it is needful in many games to see the child who moves in different angles and has some pauses, some activities the same as the above ones were given to the child that were related to standing and moving with each other. The child was persuaded to move backward and then to stop, and or move to backward in left and right directions and after that stop.

The actions of standing or stopping were trained to the child through the explanation and showing the special pattern. Thus the child was bringing his gravity center to some extent down by bending the knees to have a pause in that situation.

**Training Hand Skills in controlling the Ball: (13-16 sessions)**

Throwing: comprising of hand movements alone- shifting the weight of one foot on his own, weight shifting of foot and arm at the same time without the ball, weight transferring of foot and arm simultaneously with one ball, the practice for increasing the child's attention in hitting the ball to horizontal and vertical targets.

Grasping the ball: Hitting gently the ball, looking, touching and trying in grasping the ball that is hung from the rope and moving from right to left, far to near. Attempting in taking a ball that is hung and rotatory in front of the child through the rope. As saying in grasping the ball that is hung in different axes while the child is in a lying position.

**Results**

27 children with Down's syndrome participated in this research. The youngest child was 5 years old and the oldest one 7 years old. The Statistical indexes of the subjects' age concerning the group have been reported in Table 1.

**Table 1: Descriptive Indexes of the Subjects' age Concerning the Group**

Groups	N	Max	Min	M	SD	t	P
Experimental	12	7	5	9.34	2.12	.180	.756
Control	12	7	5	9.12	2.30		

Regarding the written figures in Table 1, the average of the subjects' age of the experimental group was more compared to the control group. The isotropy of the control and experimental groups in the age average was analyzed through the statistical test called Independent T. There was not the significant statistical difference in the subjects' age average in control and experimental groups ( $p = .756$ )

The subjects' scores were examined in the skills of the body's equilibrium, the co-ordination of hand and foot, grasping and throwing, and the gross motor skills. (Table 2)

**Table 2:** Descriptive indices of gross motor for experimental and control groups in pretest and posttest situations

Variable	Experimental group				Control group			
	Pretest		Posttest		Pretest		Posttest	
	M	SD	M	SD	M	SD	M	SD
Motor coordination	2.92	1.93	4.50	1	2.83	1.34	2.25	<b>./96</b>
Balance	5.25	1.21	3.92	1.78	2.75	1.36	3.42	<b>2.11</b>
Catch and throw	5	2.33	6.58	2.27	4.50	2.75	3.58	<b>1.97</b>
Jumping	7.83	2.04	14.50	4.14	4.92	2.99	13.25	<b>3.39</b>
Gross motor	2.67	1.37	24.17	3.88	2.50	1	13.50	<b>4.23.</b>

As Table 2 shows there are some differences between the average of control group and experimental one in the research variables; but being significant of these differences is not clear to us. Then for comparing the group the multi variate covariance analyses has been used regarding the existence of some dependent variables and their interval nature and also the performance of pre test.

The results of Hotling multi variate test are significant in statistical context, that is to say, at least in one variable the difference is significant between control and experimental groups. Then for showing more details the intergroup differences have been reported in Table 3.

**Table 3:** Results of MANCOVA for comparing the components of gross motor in two groups

Source of change	SS	D f	MS	F	Sig	2 $\eta$
Motor coordination	24.34	1	24.34	65/53	0/001	<b>./78</b>
Balance	20.34	1	20.34	22/26	0/001	<b>./55</b>
Catch and throw	64.27	1	64.27	25/83	0/001	<b>./59</b>
Jumping	87.38	1	87.38	19/34	0/001	<b>./52</b>
Gross motor	86.537	1	86.537	113/86	0/001	<b>./86</b>

As Table 3 demonstrates in all of the variables including co-ordination( p less than 0/01, F= 65/53), vestibular (p less than 0/01,F=22/26) grasping and throwing ( p less than 0/01, F= 25/83) jumping ( p less than 0/01, F= 19/34) and gross motor ( P less than, F= 113/86), the difference between two groups was significant that the consideration of the averages' table shows that in all variables the average of the experimental group was higher than the control group. It means, training sensory motivations has resulted in the improvement of motor skills.

## Discussion

The results of the multi-variate covariance analyses smack of that after the intervention, the scores average of the experimental group have increased than the control group, and this difference is significant in statistical situation.

Then acquired results could be interpreted in this way that regarding this issue that the children with Down's syndrome have the obvious retardations in the development of fine and gross motor skills and these delays leave the devastating effects on these children's development and function in daily activities of life(7). As the integration and sensory processing are important and influential factors in the children's independence with Down's syndrome, in this research with emphasis on training sensory motivations through the improvement of the central system function in processing and the integration of data, tangible breakthroughs have come up in the amendment process of motor skills in these children. Then it would be said that training sensory motivations increases gross motor skills in children with Down's syndrome. So many researches in the field of sensory motivations effects on motor skills in children with Down's syndrome and mental retardation have been performed, the results of this research is in harmony with the outcomes of some researches and in loggerheads with the outcomes of the others. Acquired results of this investigation with the Soortchi's, Mollajani's, Yanic and et al has got the similarity who had used sensory integration treatment for the development of fine and gross motions in mentally-retarded children with Down's syndrome. Also the outcomes of this study with the results of Asadidoost, Hamphries and et al who had used sensory integration treatment for children without mental retardation and with the results of Zimmer et al, Daily et al, Wang, Feddri et al, Fakhri, Aaghaee and Khajeh Hoseini has got the same equality who have emphasized the intervention effectiveness on the improvement of motor skills in children. Among the researches whose results were inconsistent with this study results we can name Miller's investigation that neither rejects nor accepts the effectiveness of sensory integration treatment. For the explanation of this matter that why the training sensory stimulation causes the improvement of gross motor skills in children with Down's syndrome, we should tell that although the development of motor skills start before the birth and continue in all of life, the improvement in motor skills need the maturation of bio-cognition and psycho-cognition systems, and learning also has got an undeniable role in this improvement. In following of the development of children's motor skills we understand that the changes of motor behaviors goes forward in terms of a hierarchical system and from simple movements to complicated ones. Any impairment in these stages causes stop and impairment in complicated stages that gross motor skills such as running, hopping, and jumping are of these skills (3, 7, 12, 15, 17-20).

The appearance of normal developmental changes to a great deal depends on the integration and interpretation of the stimulations and sensory inputs and child's first sensory experience. The more the child is good at processing of received sensory data of the environment and his body, the more the child will be successful in passing the next movement stages and improvement towards the complicated motor skills, abstract activities, and also the automation of the mentioned skills(10, 21, 22). Regarding the acquired findings in this research, we saw that after the intervention the average of the subject's group scores increased and outcomes were explanatory of the meaningful difference of this variation. Then we can claim that the training sensory motivations engenders the improvement of body equilibrium, hand and foot co-ordination, grasping and throwing, and also jumping skills, and in general gross motor skills in children with Down's syndrome.

### **Conclusion**

The results of the study showed that training sensory motivations has got the positive effects on the skills of body equilibrium, co-ordination of hand and foot, jumping and in general children's gross motor skills with Down's syndrome. Then the consideration of this issue could have the deep effect on the rehabilitation of children with Down's syndrome.

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### **Authors' Contributions**

All authors had equal role in design, work, statistical analysis and manuscript writing.

### **Conflict of Interest**

The authors declare no conflict of interest.

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### **Reference**

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