

## Gender and Multitasking In the Context of Polychronicity

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**Abstract:** *The study in hand probing the role of polychronicity and gender in multitasking performance under normal and emergency conditions of multitasking. Multitasking is the cognitive ability to perform multiple task goals in the same time period by engaging in frequent switches between individual tasks (Colom et al., 2010) but polychronicity signifies situations or preferences where people deal with several things at the same time (Kakihara & Sorensen, 2002). For the above purpose, the sample of 180 males' adults (Mean age= 21 yrs) and 180 females' adults (Mean age= 21.5 yrs) were taken up from the tricity of Chandigarh, Mohali and Panchkula. 'Index of Polychronic Values Scale' by Bluedorn et al. (1999) and a self developed simulated task for multitasking were used for the study. A repeated measures 2x2 anova and t-ratios were used out to arrive at the results. Genderwise comparative analysis showed that the high polychronic females outperform high polychronic males under both conditions of multitasking whereas in low polychronicity, males performed better than females across both conditions.*

**Keywords:** Low Polychronicity, High Polychronicity, Normal Multitasking, Emergency Multitasking, Gender, Adults, Task Goals, Attention, Distraction, Simulated Task

### Introduction

In recent decades, it has been seen that people carry out multiple activities and this may facilitate people's handling of perceived time pressures in today's society (Sullivan and Gershuny, 2001; Ghose, 2013). On the other hand, studies have also shown that in multitasking, people not only execute each task less suitably but also lose time in the procedure. The brain is forced to pause and relocate continuously as one switches between tasks under pressure (Lin, 2010). Multitasking has been described as the ability to accomplish multiple task goals in the same general time period by engaging in frequent switches between individual tasks (Konig et al., 2005). The cognitive executive process controls the performance of multiple tasks. The executive processes enable humans to choose, prioritize and monitor task performance (Arlington and Logan 2004; Iani and Wickens, 2004).

The role of the frontally mediated capacity to maintain task goals and to avoid conflicting distractions has been indicated (Kane et al., 2002; Watson, 2011) It is central to multitasking because during multitasking, the information and goals relevant to one task must be actively maintained while other tasks are being performed. Moreover, when task switching occurs then the interference from the stimuli associated with the off task must be minimized. Sullivan (2007) states that multitasking is one possible response to the burden of multiple obligations.

Poposki and Oswald (2010) defined polychronicity as a non cognitive variable reflecting an individual's preference for shifting attention among ongoing tasks, rather than focusing on one task until completion and then switching to another task. Thus, the construct exists on a continuum, with monochronicity (low polychronicity) and polychronicity (high polychronicity) being opposite poles rather than distinct concepts (Bluedorn et al., 1999). Monochronic individuals focus on one task at a time and perceive other events as disruption and on the other hand, high polychronic individuals engage in multiple activities at the same time. They switch or dovetail several tasks within the same time period (Bluedorn, 2002).

The polychronic behaviour depends on how much an individual divides his or her attention (Slocombe and Bluedorn, 1999) Thus one's tendency toward monochronicity or polychronicity has an influence on their behaviour (Diffendal, 2013). Simultaneous patterns of task execution reflect the production of two things at the exact same time (Bluedorn et al., 1992), while dovetailing can be described as the interspersing of multiple activities over time, or sequential task accomplishment. It has been seen that the brains of male subjects not only function with less blood flow than females brains but they are also structured to compartmentalize learning. Thus, females tend to multitask better than males, do with fewer attention span problems and greater ability to make quick transitions between lessons (Havers, 1995). Significantly, the present study is an attempt to probe multitasking under normal and emergency conditions across gender in the context of level of polychronicity present in the individual.

### **Research Questions**

**Q.1:-** Shall the performance of low polychronic females be better than the performance of low polychronic males under both normal and emergency condition of multitasking?

**Q.2:-** Shall the performance of high polychronic females be better than the performance of high polychronic males under both normal and emergency condition of multitasking?

**Methodology:** The study had been carried out in two phases. The phase wise description was given below.

#### **Phase-1**

##### **Sample**

An initial sample of 180 female adult subjects (Mean age= 21.5 yrs) and 180 male adult subjects (Mean age= 21 yrs) were taken from the Government Colleges of tricity of Chandigarh, Mohali and Panchkula.

##### **Apparatus and Experimental Material**

'Index of Polychronic Values Scale' by Bluedorn., Kalliath., Strube & Martin (1999) was used. This is a ten item pencil and paper test wherein the responses are set in a Likert scale range of Strongly Disagree to Strongly Agree.

**Procedure:** The test was administered individually.

**Scoring:** The scoring was carried out as per the instructions given in the manual

#### **Phase -2**

Herein, subjects classified on low polychronicity (a1) and high polychronicity (a2) male adults (87 each from N= 180 initial sample) and female adults (87 each from N=180 initial sample) with the help of Median, were administered two levels of multitasking conditions (normal and emergency condition) individually.

##### **Apparatus and Experimental Material**

The subject was presented a visuo- auditory task on the computer screen for the purpose of measuring multitasking. In this task, three analogue figures were presented to the subject and based on their analogy with each other, a fourth matching figure had to be identified from four

possible alternatives given underneath the presentation on the screen. The subject had to press the cursor on the correct alternative out of A, B, C and D on each trial. An incorrect press of the cursor would be counted as an error. For the auditory part of the visuo-auditory task, a uniform beep was sounded which changed to a high pitch just once, during one trial. On the right hand side of the screen, was given a circular target point against which the cursor was to be pressed by the subject as and when the high pitch beep occurred once during a trial.

Description of Multitasking Conditions:

- a) **Normal session (b1)**- In this condition, the above mentioned task was presented on the monitor for 40 seconds and the subject had to complete task within this time period (Slow Pace).
- b) **Emergency session (b2)** - In this condition, the task was same as in the normal session but the presentation time of the task was reduced to 10 seconds (Fast Pace).

### Procedure

The experiment was carried out individually on all the subjects. A total of 30 trials were presented to each subject i.e. 15 trials per condition and each trial was presented on the monitor facing the subject.

### Scoring

The dependent variable was total errors committed by the subject under both the multitasking conditions. To avoid the errors of habituation and anticipation, proper randomization in terms of multitasking conditions was adhered to. Each subject had to perform 30 trials in all.

### Results and Discussion

Two 2x 2 repeated measures ANOVA with t-ratios were applied with repeated measures on the last one factor. The results are as under:

#### Anova Summary Table (Females)

Table 1: Showing Summary of ANOVA (2x 2) of performance of female subjects with repeated measures on last factor.

Source of variation	SS	df	MS	F
Between SS	3283.92	173		
Polychronicity (A)	1757.24	1	1757.24	197.97**
A x SS w.gps. (Error I)	1526.68	172	8.87	
Within SS	1856	174		
Multitasking condition (B)	1162.34	1	1162.34	317.92**
Ax B	64.65	1	64.65	17.68**
B x SS w.gps. (Error II)	629.001	172	3.65	

\*Significant at 0.05 level, \*\* Significant at 0.01 level.  
( $p < 0.01$  or  $p < 0.05$ )

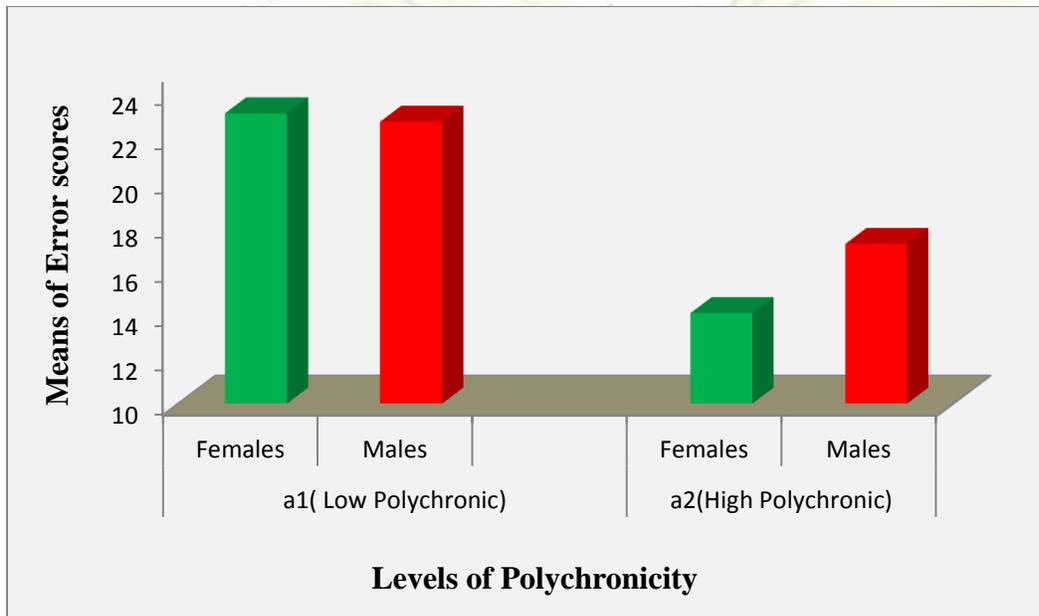
**Anova Summary Table (Males)**

Table 2: Showing Summary of ANOVA (2x 2) of performance of male subjects with repeated measure on last factor.

Source of variation	SS	df	MS	F
Between SS	2184.9	173		
Polychronicity	656.561	1	656.56	
(A)	1528.34	172	8.88	73.89**
A x SS w.gps.	2308	174		
(Error I)				
Within SS				
Multitasking condition (B)	1177.01	1	1177.01	189.56**
	62.93	1	62.93	10.13**
Ax B	1068.06	172	6.20	
B x SS w.gps.				
(Error II)				

\* Significant at 0.05 level, \*\* Significant at 0.01 level.  
(p<0.01 or p<0.05)

Polychronicity played a significant role in the execution of multitasking performance. Thus, F- value for polychronicity among females has been found [F (1, 172) = 197.97\*\*, p< 0.01] to be significant (See Table No.1) and the F- value for polychronicity among males has also been turned out [F= (1, 172) =73.89\*\*, p < 0.01] to be significant (See Table No.2).



Graph No.1:- Mean error scores of females and males for low polychronicity and high polychronicity

Trendwise, there is nonsignificant difference between the mean error scores of males and females under low polychronicity but females significantly outperformed males in the case of

high polychronicity and their respective mean error scores was also found to be significant (See Graph No.1).

Females who are inclined to be low polychronic in their time styles (Cotte et al., 2004) tend to feel time pressured when they have to perform multiple activities and competing demand of time creates conflict for them and yet they deal with one thing at a time.

Also, Bell et al. (2005) found that low polychronic females described polychronic behaviour as fragmented, confusing, stressful and lacking focus. Low polychronic context focus makes task switching undesirable or difficult because doing so draws upon many of the same higher level executive functions required for performing the constituent tasks. Even task switching is governed by central control processes (Bainbridge, 2002) thereby limiting the availability of these processes (Anderson et al., 1996) for the respective tasks between which one is switching. The experience of time pressure elicits stress which distracts individuals from the task at hand (Bargh, 1992; Keinan et al., 1999) and thus low polychronics perform poorer on multitasking. Hence, there are no gender differences in the performance of low polychronicity under both normal and emergency multitasking condition.

In high polychronicity, female undertake a greater amount of total work than males, when the time in both primary and secondary activities is combined (Ministry of Females Affairs, 2002).

High polychronicity has been reported as related to both task-oriented and socially oriented performance (Carragher et al., 2008). Also, the link between high polychronicity and performance in a variety of occupations and work settings (Frei et al., 1999; Conte and Gintoft, 2005) has been found.

Females are more likely to overlap activities than males because females have been found to have the ability to perform multiple activities simultaneously and females are proficient at extending time through polychronic use (Floro and Miles, 2003).

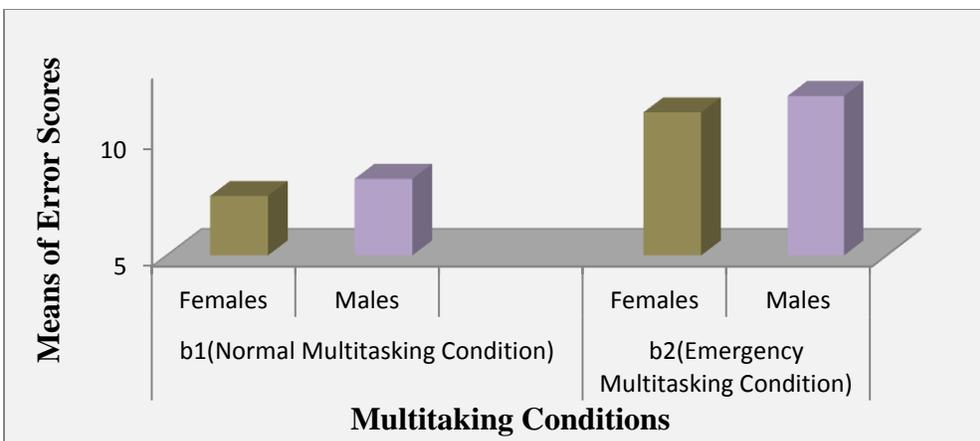
Duxbury & Higgins (1991) found that females are more polychronic than males in any aspects of time usage, from the entire approach to tasking, to the ways in which they communicate with other people.

Individual's time oriented behaviour may act as a catalyst or pacing mechanism for subsequent behaviours. Polychronic behaviour (the group's performance of multiple tasks simultaneously) has significant effects on individual outcomes (Waller et al., 1999). Thus, polychronic behaviour is a distinct pattern (Slocombe and Bluedorn, 1999) of pacing and time utilization that may have important inferences for performance.

Thus, polychronicity is a construct for studying multitasking and high polychronic females describe such behaviour as efficient, realistic and motivating (Bell et al., 2005).

Multitasking conditions also play a significant role in the overall multitasking performance. The main effects for multitasking conditions ( $F= 317.92^{**}$ ,  $df 1,172$ ) turned out to be significant in the repeated measures anova, for females (See Table No.1). Likewise, the main i.e. multitasking conditions ( $F= 189.56^{**}$ ,  $df 1,172$ ) effects turned out to be significant in the repeated measures anova, for males (See Table No.2).

However, the mean differences between error scores of females and males were found to be non significant across b1 (normal multitasking condition) but mean differences between error scores of b2 (emergency multitasking condition) of females and males were found to be significant. Trendwise, females seem to show better performance than males under both conditions of multitasking (Graph No.2).



Graph No.2:- Mean error scores of females and males under normal and emergency multitasking conditions.

Females are more likely to report doing two or more activities simultaneously than males (Bittman and Wajcman, 2000; Ren et al., 2009). Laws (2010) has provided evidence of female multitasking superiority and even concluded that females planned more strategically than males while performing any task. Further, Bauer et al. (2008) speculate that females generally are socially oriented and thus able to respond nearly simultaneously to a number of cues while males tend to be more task oriented and also single minded in their focus.

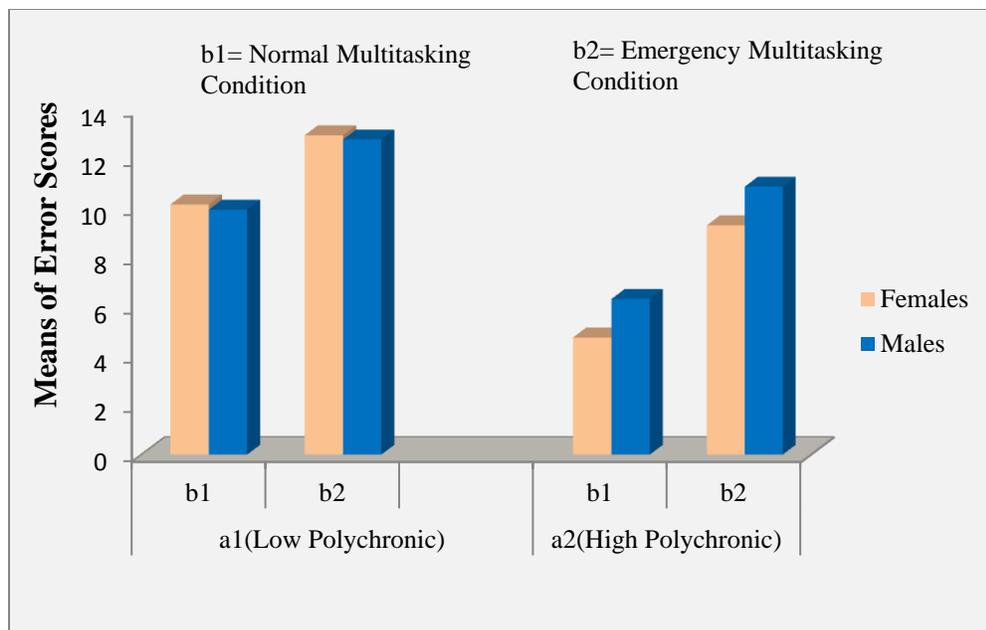
Neurologically, it was found that males lateralize brain activity. Their brains not only function with less blood flow than females brains but they are also structured to compartmentalize learning. Thus, females tend to multitask better than males do with fewer attention span problems and greater ability to make quick transitions between lessons (Havers, 1995). In addition, both males and females accommodate the conflicting demands of work and family differentially, such that females tend to restructure their tasks and time more frequently than males (Karambayya and Reilly, 1992). Qualitative studies also confirm that the existence of more time pressure during the day will contribute to increased feelings of hurriedness (Southerton, 2003) among females. This might lead to better multitasking even under time pressure.

**Comparative Analysis of Interaction Effects**

Table 3: Means S.Ds and t-ratios of performance under both multitasking conditions, for low polychronic and high polychronic groups, across gender.

Variable	Groups	Means	S.Ds	t-ratios
a1 x b1	Females vs Males	10.15 vs 9.94	3.03 vs 3.29	.43
a1 x b2	Females vs Males	12.94 vs 12.77	2.41 vs 1.78	.53
a2 x b1	Females vs Males	4.79 vs 6.34	2.13 vs 2.67	4.23**
a2 x b2	Females vs Males	9.31 vs 10.87	2.42 vs 2.99	3.78**

\*\* Significant at 0.01 level



Graph No.3:- Comparisons of means of error scores of Ax B interaction under both multitasking conditions for low polychronic and high polychronic subjects, across gender.

The interaction effects of polychronicity and multitasking conditions ( $F= 17.68^{**}$ ,  $df 1,172$ ) turned out to be significant in the repeated measures anova for females (See Table No.1). Likewise, the interaction effects of polychronicity and multitasking conditions ( $F= 10.13^{**}$ ,  $df 1,172$ ) were found to be significant in the repeated measures anova for males (See Table No.2).

It may be seen from the Graph No. 3, with regard to gender, the mean error differences of low polychronic subjects has been found to be non significant under normal and emergency condition of multitasking whereas the difference between the respective means of high polychronic subjects has turned out to be significant. Trendwise, the males performed better than females under both conditions of multitasking in low polychronicity group whereas with regard to gender in high polychronicity group, females outperform males under both condition of multitasking. The rationale for the high polychronic females better performance in emergency multitasking condition is that time pressure can lead people to work in a more focused manner and can be activating. This may enhance enjoyment and improve performance (Gardner, 1990; Zivnuska et al., 2002; Chajut & Algom, 2003; Baas et al., 2008), since polychronics are able to improve their time use by engaging in several activities in a given time as opposed to only completing one task.

Thus, polychronicity has been found to interact significantly with normal as well as emergency multitasking behaviour, across gender. In line with earlier studies (e.g. Stachowski, 2011) high polychronic subjects seem to show better performance than the low polychronic subjects on multitasking because those skills are congruent with their preferences, across gender.

### Research Implications

Polychronic or Monochronic individuals can perceive and use time in two different ways. High polychronicity determines the efficiency of an individual in situations where there have been multiple roles and responsibilities. It has important implications for both domestic and work

place situations. Polychronics are quite flexible by nature which further facilitates them to adapt to any situation. The inbuilt social orientation of females is facilitated due to polychronicity.

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