

An Empirical Quest for Linkages between HPWS and Employee Behaviors – a Perspective from the Non Managerial Employees in Japanese Organizations

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Abstract—High Performance Work Systems (HPWS) generally give rise to positive impacts on employees by increasing their commitments in workplaces. While some argued this actually have considerable negative impacts on employees with increasing possibilities of imposing strains caused by stress and intensity of such work places. Do stressful workplaces hamper employee commitment? The author has tried to find the answer by exploring linkages between HPWS practices and its impact on employees in Japanese organizations. How negative outcomes like job intensity and workplaces and job stressors can influence different forms of employees' commitments which can be a hindrance to their performance. *Design:* A close ended questionnaire survey was conducted amongst 16 large, medium and small sized Japanese companies from diverse industries around Chiba, Saitama, and Ibaraki Prefectures and in Tokyo from the month of October 2008 to February 2009. Questionnaires were aimed to the non managerial employees' perceptions of HPWS practices, their behavior, working life experiences in their work places. A total of 227 samples are used for analysis in the study. *Methods:* Correlations, MANCOVA, SEM Path analysis using AMOS software are used for data analysis in this study. *Findings:* Average non-managerial perception of HPWS adoption is significantly but negatively correlated to both work place Stressors and Continuous commitment, but positively correlated to job Intensity, Affective, Occupational and Normative commitments in different workplaces at Japan. The path analysis by SEM shows significant indirect relationship between Stressors and employee Affective organizational commitment and Normative organizational commitments. Intensity also has a significant indirect effect on Occupational commitments. HPWS has an additive effect on all the outcomes variables. *Limitations:* The sample size in this study cannot be a representative to the entire population of non-managerial employees in Japan. There were no respondents from automobile, pharmaceuticals, finance industries. The duration of the survey coincided in a period when Japan as most of the other countries is under going recession. Biases could not be ruled out completely. We must take cautions in interpreting the results of studies as they cannot be generalized. And the path analysis cannot provide the complete causality of the inter linkages between the variables used in the study. *Originality:* There have been limited studies on linkages in HPWS adoptions and their impacts on employees' behaviors and commitments in Japanese workplaces. This study may provide some ingredients for further research in the fields of HRM policies and

practices and their linkages on different forms of employees' commitments.

Keywords—HPWS, Job Intensity, Job and workplace Stressors, Continuous commitment, Affective commitment, Occupational commitment, Japan.

I. INTRODUCTION

RESEARCHES in HR literatures indicated some HRM practices enable organizations to perform better by attracting, motivating, and retaining a number of highly committed human resources [1, 2, 3]. Academics tend to believe there are two models of HRM practices: the control model and the commitment model [2, 4]. As the name suggested control model is to reduce direct labor costs or improve efficiency by defining strict work roles and procedures Previous with rewards and monitoring are considered to be the effective tools to manage the workforce [2].

The intention of the commitment model, on the other hand, is focused on how to increase the psychological relationship of the employees towards a concurrent goal by inducing desired employee attitudes and behaviors. The commitment approach of employees' development, involvement, participation, and long-term orientation are considered to be the significant means of increasing human resource productivity and positive outcomes [2, 4]. The commitment, rather than control model of HRM practices is said to serve as a source of competitive advantage by extracting greater work commitment and motivation of the employees within an organization. McDuffie [5] has introduced the concept of HR bundle, and illustrated that the effect of HRM practices as a whole (or bundle) on performance is much greater than that of individual HRM practices. Many authors [6] supported this view, and explained that the bundle of HRM practices is more likely to enhance employees' desired attitudes and behaviors since it can provide the mutually reinforcing conditions that support employee motivation and skill acquisition. Although the design of the research differs somewhat from researcher to researcher, a stream of recent studies suggests that the effects of HRM practices on employee commitment are neither direct nor unconditional but rather complicated. Following the recent

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empirical findings one can assume that there would be some intervening factors that mediate the relationship between HRM practices and employees' commitments. Due to the limited number of studies that examine mediators between HRM and employee commitment, there are now a variety of speculations among researchers in this field as to what would be the important factors that mediate this relationship. The purpose of this study is to find linkages between such HRM practices which are supposedly designed to elicit performance or commitments in the employees under the high performance work system (HPWS) and forms of employee commitments. Secondly to explore the inter relationship between the different forms of commitments and employee perceptions regarding their behaviors towards workplace or job stressors (henceforth stressors in the study) and job intensity (henceforth intensity in this study) which also supposed to form as by-products of HPWS.

II. VARIABLES IN THIS STUDY

A. High Performance Work Systems (HPWS)

Literatures on HPWS suggest disagreements as to which HR practices construed HPWS as a single entity [7]. Yet most of these HR practices are also known as the soft approaches or the Harvard model in HRM [8] or the best practices or the commitment model also defined as "development humanism", [9], which are all but conceptually found to be similar to Japanese people management systems. Huselid [10] developed 13 best HR practices as "high performance work practices". Later Pfeffer [11] outlined seven best practices similar to these practices which also have a resemblance to the Harvard model of HRM. HPWS comprises both these high involvement and high commitment HR practices. Several researchers have used these conceptualizations interchangeably [4, 12]. Previous researchers have also argued and debated on the various effects of HPWS on the employee behavior and their perceptions on work intensity and work places stressors [7]. But to some extent most of the authors have reached to a consensus that the ultimate objective of either of commitment, or involvement high performance work system or some other HR systems are the same. They aim to increase productivity and profitability of the organization.

The most referred HR practices used in various studies of HPWS [7] are: (a) Targeted selections and recruitment [13, 10, 12]; (b) Formal training as the indicator of employers' commitment to invest in human capital [10, 14, 13, 12]; (c) Internal promotions or selections to fill vacant positions [15, 10, 9]; (d) Employees' participation programs [15, 10, 16, 17, 9, 12]; (e) Teams as a fundamental unit of organization [15, 16, 17, 1, 12]; (f) Formal performance appraisal [10, 17, 13]; (g) Development appraisal [18, 14]; (h) Performance based pay systems [15, 16, 10, 17, 14, 9, 1, 12]; (i) Merit based promotions [15]; (j) Formal communication programs to keep employees informed about the firm [15, 10, 9, 12]; (k) Reduced differential status between managers and employees (egalitarian) [16, 17, 9, 12]; (l) Formal grievance or complaint resolution systems [19, 10, 9]; (m) Employee job security policies such as no compulsory redundancies [17, 9, 19, 12];

(m) Formal Job analysis (job description) job design, safety [10, 12].

B. Job Intensity

Intensity in jobs or work can be explained by the degree of intensity felt by an employee that covers heavier workloads, tighter deadlines and faster work paces [20]. Studies of many scholars have shown a positive relation between a better balance of work load and private life of employees in HPWS work places like [21, 22, 23, 24, 1]. But some authors like Ramsay et al. [25] sees that HPWS eventually induce increased employee discretion, and contested this may lead to intensification of work. The intensification of work is often related to increase responsibility in a team more speedy disposal of work, and a tighter deadline with a lesser number of people. Though information sharing with employees may even reduce work load, as the employees can prepare themselves for the forthcoming changes well in advance, there are counter arguments too. Various trainings to employees can lead to broaden tasks of a given job [26] and in such cases many organizations will like to get the return of their investment in the human capital in the form of increased productivity [5] can also induce further intensification of works.

C. Work Places and Job Stressors

Stress has been defined to be an interaction between individuals and any source of demand (stressor) within their environment. A stressor can be "the particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" [27]. In other words a stressor (something causing stress), real or perceived, is "an event that an individual interprets as a hassle or troublesome" [27]. Job stress has been defined as a condition wherein job-related factors interact with the worker to change his or her psychological or physiological condition such that she or he is forced to deviate from normal functioning [28]. The stressors has also been identified as working conditions [29]; building level support, administrative support, role dissonance, and role ambiguity [30]. Team members knowingly or unknowingly, frequently exert pressures on one another as a result of divergences in values, mistrust or an unfair microenvironment within the team in itself [31]. Stress can also occur as a result of role conflicts, particularly those arising out of the different expectations of superiors [32] [33], and the various behavioral expectations of their positions [34]. Excessive workload, e.g., due to intensive work undertaken over a limited timeframe (quantitative overload) or managerial ineffectiveness is another source of task stress. Researches show fatigue and reduced efficiency may occur as a result of increased stress levels [35]. Task stress can also result in depression, low self-esteem, dissatisfaction, futility and the intention to leave [36]. The proponents of fun in workplaces claim that when people have fun doing their jobs, they experience less stress [37, 38, 39], and are less like to be absent or leave the organization [40, 41]. Social support has long been argued as being quiet influential in the stress coping process amongst the individuals [42, 43].

TABLE 1 CORRELATIONS BETWEEN VARIABLES

VARIABLES	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1. HPWS Average	3.35	0.62	0.89											
2. Affective commitment	4.19	0.90	0.51 ***	0.86										
3. Continuous commitment	4.24	0.99	-0.25 ***	-0.17 **	0.62									
4. Occupational commitment	4.00	0.92	0.37 ***	0.60 ***	-0.19 **	0.75								
5. Normative commitment	3.16	1.02	0.35 ***	0.42 ***	-0.15 *	0.41 ***	0.61							
6. Stressors	3.28	0.68	-0.32 ***	-0.34 ***	0.18 **	-0.37 ***	-0.15 *	0.86						
7. Job Intensity	3.94	0.81	0.14 *	-0.01	0.10	-0.02	-0.01	0.42 ***	0.64					
8. Age	2.39	0.95	-0.21 **	-0.09	0.14 *	-0.12	-0.05	0.08	-0.03					
9. Number of employees	2.43	1.72	-0.15 *	-0.09	0.11	-0.02	0.04	0.04	-0.03	-0.28 ***				
10. Years of service in the current co.	1.86	0.89	0.14 *	0.07	-0.11	-0.02	0.03	-0.16 *	-0.10	-0.60 ***	0.23 **			
11. Years of service in other co dummy	0.26	0.44	-0.34 ***	-0.10	0.06	-0.10	-0.05	0.24 ***	0.03	0.19 **	0.16 *	0.06		
12. Main bread Earner	0.66	0.48	0.05	0.05	-0.08	0.18 **	0.02	0.02	0.02	0.03	-0.05	-0.09	-0.09	
13. Dependants	3.03	1.38	-0.01	0.01	-0.04	-0.09	-0.05	-0.09	-0.09	-0.23 **	0.11	0.21 **	-0.07	0.03

Cronbach alphas are in parenthesis on the diagonal

All significance level are two tailed. * = p<.05, ** = p<.01, ***= p<.001
Descriptive statistics and Pearson's correlations between variables n = 227

Stressors have been shown to be associated to those circumstances devoid of having helping behaviors of the employees both in and out of the workplace [44, 45]. Emotional dissonance can also lead to stress and burnout experienced by individuals [46]. Such dissonance occurs when employees express emotions according to the employers' expectations [47] or could result because of the norms set up by the peers in a working team or when the co-workers or when the company ignored plea of social support [47]. Employees in HPWS tend to

acquire more skills – such as learning how to carry out a wider range of tasks, better interpersonal skills, and how to deal with supervisory and coordinating functions [48]. But there may be possibility of stressful situations when the employee risks a challenge but fails and consequently reprimanded by superiors. Such organizations do not encourage in a learning atmosphere and workers fear mistakes and perpetuate stressful working conditions. Many authors in HPWS literatures have argued that high induction of HR practices can result stressful work places [7] leading to a system that function that often been exclaimed as a “management by stress” [49].

D. Employee Commitment

Commitment can be defined as a state of psychological attachment that defines the relationship between an actor (employees) and an entity (organization or occupation or both). Mayer and Allen's scale of affective, continuous and normative commitment is adapted in the study. Affective depicts positive affection of employees rationalization and attribution towards their organization. Continuous is on the side bets theory and normative is on employees sense of obligations and expectation towards their organization. The scale of Meyer and Allen has been widely used for measurement of different forms of commitment and has been applied across different cultures. For example in China [50, 51], Korea [52], Nepal [53], Pakistan [54], and Turkey [55, 56], in the UAE [57], the Sultanate of Oman [58], Jordan [59], Thailand [60], and also in Japan [61, 62]. Occupational commitment is adapted from Blau's career commitment scale [63] for this study which largely based on employees' attachment towards his job ,career or occupation. However relationship of HPWS with different forms of employee organizational commitments are has mixed results with some suggesting a clear strong relationship while some has shown a mediated relationship with trust, job satisfaction and other forms of attitudes and some not very clear [7].

III. HPWS in JAPAN

There are few studies regarding HPWS in Japan. While in one of the first kind of such studies like Takeuchi et al [64] adopted 21 items scale of high commitment work practices [65] in the Japanese context. He found positive correlations between HPWS and the collective human capital of the employees and social exchange amongst the managers and non manager employees. The human capital and social exchange variables had a mediating relation to the relative establishment performance of the firm. They found perceptions of the managers to have high value of employees' ability, considering high resources of competitive advantage for their HPWS organizations. But researches show this can also likely to increase employee discretions and company can emphasize achievements or results [66, 14]. The firm will show tendency to invest in the human capital only if there are any expectations of return of such employee investments. Increasingly companies around the world are found to be strengthening development for talents through competency analysis, different assessment of abilities and needs and the formulation of action plans [67, 68].

Japanese domestic firms have traditionally institutionalized a practice of lifetime employment and extensive trainings to foster human capital investments more than foreign firms in Japan [69]. But arguments like in difficult economic situation as in recession, companies may find extremely difficult to maintain such institutional safe guards. Although cutting wages and employment could be an economic necessity to improve cash flows [70], this could also hurt performance by undermining employee trust, loyalty, and commitment [71].

After the economic bubble burst, the Japanese economy grew at an average annual rate of 1.7% between 1992 and 1997 and saw further declines to 0.2% between 1998 and 2002. This financial sluggishness with global competitiveness increased the pressure for economic efficiency on managers, and

shareholders, leading to the advent of hybrid form of corporate governance and HRM [72]. The lifetime employment system has also started declining and now could exist in few companies and could have a bleak future [73, 74].

During the prolonged recession, many firms has restrained hiring and encouraged middle-aged and older employees to opt for early retirement, thus increasing the workload of employees in the "core" age groups, and raising the likelihood of more work accidents. Research say that the increase in workload per individual in Japanese workplaces are due to recent measures to reduce workforces, and intensified competitions among workers due to the introduction of performance-based wage systems resulting in excessively long working hours. Even though high workload has not resulted in increased salaries or promises of better treatment in the future [75]. There have been an increased "service overtime" overtimes without any payments in Japan. A recent survey by Genda [76] figured the most item reasoned for working hard many hours voluntary were "to reach the norms assigned to me" (around 44.7%). While 21.6 percent answered, "to improve my own ability," a large percentage gave negative reasons for working overtime without pay, "because my colleagues also worked overtime without pay" (22.4%). But it actually appeared that the main reason has been that "they are afraid to stop working" [76]. But we still not clear why this fear initiate from, is it of losing their jobs or losing face in the team or to show their commitments to their works and organizations. Research also indicated that the labor movement has failed to secure implementation of a 40-hour work week norms for all workers in Japan [77].

It can be argued that if the employees are given more discretionary powers to carry out their works diligently and the pressure to give results and to perform harder will increase intensity of job functions. In such cases it won't be reasonable to predict that induced competitions amongst the employees to achieve targets can bring disharmony in the working teams, possibly negative emotions and create stressful workplaces [7]. There are increasing incidents of over work and unpaid overtimes or "service overtime" leading to occasional death or job burn out known as *kharoshi* (job burn out) may erode employees' emotional attachment or trust in the management thus to their affective commitment. Such organizations will probably lead to increase their continuous commitment to the organizations and the occupational commitment for the career oriented individuals[7] These careerists usually younger in age may feel these stressors are just professional hazards in their occupation or careers. Research show educated workers are deeply disappointed to seniority wages and long term employment system in Japanese organizations [78].

IV. HYPOTHESES

- (i)The employee perceptions of HPWS have positive significant relationship with Stressors and job intensity.
- (ii)Job Intensity and Stressors are positively significantly correlated.
- (iii)HPWS has negative impact with affective commitment through Job Stress and Job Intensity or in simple words Stressors and Intensity will have a mediated relationship with HPWS and affective commitments.
- (iv)HPWS has a positive and significantly correlated to each of

normative, affective, continuous and occupational commitment.

(v) Job stressors and job intensity has positive impact with continuous commitment.

(vi) Stressors and Job Intensity each has no significant direct impact with occupational of the employees.

V. RESEARCH DESIGN

The author initially targeted to collect information from multiple respondents both from the non managerial employees and from the line managers working in a private Japanese organization or a foreign subsidiary in Japan. The author issued a cover letter to all the leading organizations in Japan to voluntarily cooperate in the research study. The request letter was prepared in Japanese describing the purpose of the study re- assuring the organizations of complete anonymity of the respondents and the organization in the research process and academic publications. Since Japanese culture still traditionally emphasizes in inter personal relationship [79] and also a high context communication style [80] the author found it to be practical to consult with his research guides and faculties of his university to use their personal contacts to expedite responses rate. The author then took their personal letters of references to contact the Human Resource Managers or managers in personal departments (*Jinjika/ Jinjibu*) to seek an appointment for site visits and also to seek permissions to fill out questionnaires from the employees and managers. The author has not confined within large Japanese conglomerates only but reached to the medium sized and smaller organizations to see how HPWS practices are been perceived to be in executed in their workplaces and the linkages to their behaviors. As mentioned before the respondents were all assured a complete anonymity, respondents were not asked to sign their name in the questionnaire answer forms. No signed consent letters were also asked from the organizations. But to increase the response rates the author contacted the concerned managers in charge by emails and follow ups by phone call. Most of the organizations allowed the factory visits but there were no possibilities to randomly select respondents owing to the busy schedules of the employees in the workplaces. In most of the cases it took considerable time to take permission from the top management and different departments. So in such cases bunch of questionnaires (approximately 40 questionnaires) were given to the personnel managers in *Jinjika* to distribute them to willing employees and managers. The response rates of the managers were not satisfactory. However only the data in terms of responses collected from the non-managers are used for this study. In order to minimize biases the author with the reference of his research guides approached to the labor unions affiliated to Japanese Trade Union Confederation also known as RENGU (*Nihon Rodo Kumiai So Rengo Kai*). Some of the high officials for example in a large conglomerate of beverage and food industries took keen interest in the study and volunteered to distribute questionnaires amongst its members belonging to their companies and to their sister concerns. In some occasions the author was invited to their congregations and was provided to take interviews with willing members of the Union. The author through his personal network also approached to other labor Unions affiliated to the RENGU in Chiba Prefectures

outskirts and bordering areas of Tokyo namely *Soubu Chiiki Kyogikai* to seek its assistance in collecting data from the union members working in different organizations in the areas. The author in most of the case accompanied the high officials of this union to visit different organizations to seek the voluntary participations of non-managerial employees in the survey. The respondents were asked to fill out the questionnaires in most of the cases and in some cases requests were made to post their filled out questionnaires directed to the author in envelopes with prepaid self-addressed postage stamps (all provided by the author). There were no incentives and cash payments offered to any participants but as a part of Japanese custom the author took small gift (*omiyage*) as token of gratitude to personnel managers of the companies and the Union officials who assisted in the data collection process. There were no organizations or employees volunteered from any of the automobile and automobile spare parts industries, retails, pharmaceuticals, finance, hotel or insurance industries in the study. In this sense the sample may not be representative of the entire Japanese employees' population working in the Japanese organizations.

VI. MEASUREMENT INSTRUMENTS

The questionnaires are adapted from the previous researchers for HPWS, Job intensity, Stressors in workplaces (in this paper as stressors as shorter version) and different forms of employee commitments. The questions are initially adapted and reworded from its original English version. Since the target of this study is native Japanese speakers, all the questions are translated to Japanese language initially by the author following general conventions of back translation as proposed by Brisline [81, 82]. The questionnaires are then corrected to improve the translation to Japanese language by the two academic guides of the author. These two native speaking Japanese guides are faculties in the Reitaku University in the field of Economics and Human resource management. After addressing the issues relating to the Japanese language the questionnaires are once again asked to some employees, not participating in the survey to give their reactions and feedbacks regarding the comprehensions of the languages in the questionnaires. All the discrepancies are addressed as far as possible before finally approaching the different organizations and Unions seeking their participations in the study. The details of the survey instruments of all the variables are described in the following sections of the paper.

VII. DEMOGRAPHY OF THE SAMPLE

Data are collected directly from the general employees working in large leading Japanese conglomerates of high end electronics and electrical business, trading and diverse businesses from manufacturer exporters and importers etc having worldwide establishments, conglomerates of food and beverages, conglomerates of building materials in Japan. Responses are also collected from some small factories for manufacturing moulds, engineering parts and other diverse manufacturing units, exporting units in and around Noda city in Chiba and Saitama prefectures in Japan. Rests of the data are collected from the Union members affiliated to RENGU. They belong to large groups of a transport company, food makers,

manufactures of high end computers and related products, gas and fuel companies, electricity and energy renewal industries and others small and medium industries with work places employing people of more than 5000 to a minimum of 20 employees in Japan. A total 250 respondents from non manager employees are collected of which 23 respondents are rejected owing to their incomplete fill out of questionnaires. Finally 227 samples are found suitable for analysis in this study.

All the respondents in the study are native Japanese male (98%) and female (2%). 73% of the respondents are married. Average respondents are divided within the age group (mean = 2.39, SD = 0.95) of 30- 39 years old which are the maximum of 48%, followed by age group within 40-49 years with 21%. There are age group of respondents within 29 years and within 50-59 years of with both being 15% each. Only 1% of the respondents are above 60 years old. All the respondents are permanent employees and are holding non managerial posts in their organizations. The target is to get access to a diverse population of respondents across different industries to minimize biasness as far as possible. Likewise the respondents in this study are not limited only to the production with responses around 41% , but are also from the employees in the maintenance department of 30% , administration and others 17% sales and marketing 11% followed by IT and software development with only 1%. A total 46% of the respondents are high school graduates, university graduates are 40% followed by professional schools and other form of educations being the rest. There are diverse background of the size of the organizations they represented which the author collected from the number of employees (mean= 2.43, SD=1.724) working in their shop floor. Total 43% of the respondents are from the organizations employing more than 5000 people followed by 26% belonging to organizations employing people of about 1000-4999 people. The rest represented medium sized and small sized organizations ranging employees from 300-999 with 5%, 100- 299 with 7 % , 50-99 with 9 % and 10 – 49 people around 10%. There are responses from employees around 66% of who claimed to be the main bread earners in their family (mean= 0.66, SD = 0.476) and 75 % has dependants (mean= 3.03, SD = 1.376) in their family. Further 42% of the respondents have more than 16 years of continuous service in the current organization (mean = 1.86, SD= 0.886) with 74% of the people have no experiences in working in other organizations which are collected as years of services in other organizations apart from the one he is currently employed (mean = 0.255, SD = 0.437). The sample has 70% of the respondents with a monthly salary ranging from 250000 Yen to 350000 Yen, with 18% and 12% has a salary above 350000 Yen and less than 250000 Yen respectively.

VIII. MEASUREMENT OF VARIABLES

A. HPWS

An aggregated response of non managerial employee perceptions regarding the degree of practice of HPWS is averaged using 21 items as referred in the appendix 1a. The author in this paper wanted to explore a little further to validate the previous findings in Japanese organizations by modifying the scales with new items used by previous researchers in non Japanese working cultures. Like questions on selection

procedures unlike [83] is asked to the respondents. Further rewording scale adapted by [64] the author asked employee perceptions regarding team work using items like “ My works requires closely to work together with other members of a team to achieve common goal” as prescribed by previous researchers [15, 1]. Queries like “I have participated in the employee attitude survey carried out by the company in the past years” [15, 10] and perceptions regarding “formal grievance and resolution system” [9, 10] are also asked. Usage of “occupational safety and security measures” used by previous authors [12] is added to the total item list to construct HPWS. Item regarding “formal policies on compulsory job redundancies” is avoided in the study as such practices are common in Japanese companies. Even though some rare occasions has taken place during the end of 1990 as a part of restructuring process [84] for which many claimed to be the end of “lifetime employment” in Japanese corporations as described before in this paper. Generally it is not very common to retrench full time employees suddenly in the Japanese organizations. Authors like Takeuchi *et al* [64] also did not include this item in their scale of measurement of HPWS in Japanese organizations. Employees are asked to mark their answers from 6 to 1 point in Likert scales ranging from Very accurate =6 to Very inaccurate=1. The 21 item scale of HPWS has a Cronbach alpha reliability of .89 (mean = 70.3, SD = 13.0). The Interclass Correlation Coefficient (ICC 2) for the average measure is found to be 0.89, greater than single measure (ICC 1) of 0.27. The value is well above .60 [85] confirms the use of mean aggregated responses of the employee perceptions of HPWS practices in workplaces as appropriate. Details of the inter item total statistics can be seen in the appendix 1A. Factor analysis using Principal Axis factoring analysis is used to examine factor structure of the single dimensional conceptualization of HPWS as followed by most of the previous researchers [64]. Very unlikely though formal performance appraisal and additional pay rise in last year have a low factor loading. An Eigen value of 6.97 with 33.18% variance is explained.

B. Degree of workplace/job Stressors

The target of this study has been to get a sense of perception of the stressors causing stress and strains in the HPWS workplaces or on the shop floors. These stressors may have arisen due to working environment or climates and the job by itself and are the by product of outcomes of employee performance in the HPWS workplaces. The author adapted in total 24 items from different researchers in field of stressful workplaces. For instances to know their perceptions regarding the level of mistrust and disbelieve, conflicts with colleagues and supervisors, competitive speedy disposal of works, work loads, jobs influencing private lives, job specification and role ambiguity adapting from the questions set by Leung *et al*[86]. For examples question like “I often feel treated unfairly in the organization.” Or “My family wants to spend more time with them but I can’t make it.” Next the author asked about the perception of degree of organizational citizen behaviors practiced in their workplaces by his colleagues and supervisors. How HPWS workplaces are affected with the helping and civic virtue of the employees adapted from the previous works [87]

by asking how the employees felt on situations like “We don’t have the time and will to help other employees out if someone falls behind in his/her work.” Perceptions on how emotional dissonance [46] of the employees are affected in HPWS workplaces a, like “I often have to hide my true feelings while I am with my co-workers.” HPWS workplaces may be affected with an environment not congenial of co-creation by learning and taking risks together for a fear of mistakes which may put people in stressful situations. As for examples like “Managers at all levels create a climate which encourages experiments and acknowledges that the mistakes are inevitable part in the process”. Issues of having less sense of empowerment amongst the employees could also affect the level of stressful workplaces as for examples like “I don’t have considerable opportunity for independence and freedom in how I do my job”, adapted from [88]. Researches have revealed that less of fun and emotional exhaustions in workplaces affect well being of the employees. Adapting from Karl and Peluchette [89] perceptions of having fun without emotional exhaustions in workplaces are asked like “I rarely have any fun or sense of humor in workplaces”. All the questions are asked with a Likert scale of 6 to 1 ranging within six options like very accurate = 6 to very inaccurate=1. Reliability Cronbach alpha is found to be 0.86 (mean = 78.6, SD = 16.2). The average measures of Inter Correlation Coefficient (ICC 2) are 0.86 well above the accepted level as prescribed by [85]. This value is much greater than single measure (ICC 1) of 0.21 further provided strong evidences to use the aggregated average value of the stressors as a single bundle. Details of the 24 items in the stressors with item total statistics are given in the appendix 1F. A Principal Axis Factoring method is used and an Eigen value of 7.32 with 26.3% variance explained on a single factor is obtained.

C. Degree of Job Intensity

Four questions are adapted from the scale of Job Intensity used by Kalmi and Kauhanen [26] and one question is added to the scale to see how the increase of speed of work in HPWS workplaces affected to increased intensity. For examples “I have to stretch my workday often in order to manage all the work.” Or “I am experiencing an increase in the speed of work and the efforts in my job”. The reliability Cronbach alpha of the total five items is 0.64 (mean = 19.7, SD = 4.1) generally considered adequate in social studies [90] [91]. All the questions are asked in a 6 point Likert scales from very accurate=6 to very inaccurate=1. With higher points showing

more intensified working environment. Details are in Appendix 1B.

D. Degree of Affective commitment

The 8 items scale measuring affective organizational commitment of Meyer and Allen [92] is adapted from which finally 7 items have been used in the study. This scale has been used in other research studies regarding commitment across different working cultures in different part of the world as explained before. Some questions are reworded as “I am proud to tell others that I work for this company,” and only one reverse rated question like “I don’t feel like family atmosphere in the company floor” are added in the measurement. Similar 6 points Likert scale is adopted as the measuring instruments. The reliability scale of Cronbach alpha is 0.86 (Mean = 29.3, SD= 6.3). Details of the item total statistics are in the appendix 1E.

E. Degree of Continuous commitment

The 8 items scale of measuring continuous commitment of Meyer and Allen [92] are primarily selected to be appropriate for the study. Finally 3 items are adapted like for example “One of the reasons I work here is that leaving this company will require considerable sacrifices of benefits I draw from this company right now and which is not available to find in other companies.” The employees are asked to rate from in a 6 point Likert scale ranging from very accurate = 6 to very inaccurate =1. The reliability Cronbach alpha is 0.62 (Mean = 12.7, SD= 3.0). Previous authors [62] using 4 items of the same scale of Meyer and Allen has also a found a low alpha of 0.67 in their findings. See appendix 1 C.

F. Degree of Normative commitment

Meyer and Allen [92] normative commitment scale is used in the study. Three items are finally adapted to get the sense of normative commitment of Japanese employees in HPWS workplaces. Cronbach alpha reliability is .61 (Mean= 9.47, SD = 3.07). Examples like “I don’t think that wanting to be company man or woman is sensible anymore.” A similar 6 point Likert scale is used from very accurate =6 to very inaccurate=1. Details of the items are in the appendix 1D.

TABLE II MANCOVA BETWEEN HPWS & EMPLOYEE BEHAVIORS

VARIABLES	Affective Commitment		Continuous Commitment		Occupational Commitment		Normative Commitment		Stressors		Job Intensity	
	F	Partial Eta	F	Partial Eta	F	Partial Eta	F	Partial Eta	F	Partial Eta	F	Partial Eta
Corrected model	3.32 ***	0.522	1.63 ***	0.349	1.60 ***	0.345	1.87 ***	0.381	2.83 ***	0.482	1.99 ***	0.395
Age	0.60	0.004	0.56	0.003	8.78 **	0.049	0.10	0.000	0.52	0.003	1.19	0.007
Years of service in the current co.	0.49	0.003	0.10	0.001	7.60 **	0.043	0.02	0.000	3.53	0.020	4.40 *	0.025
Years of service in other Co dummy	0.64	0.004	1.14	0.007	0.35	0.002	2.26	0.013	8.09 **	0.045	2.05	0.012
HPWS average	3.40 ***	0.514	1.60 *	0.333	1.53 *	0.323	1.95 ***	0.378	2.39 ***	0.427	1.94 ***	0.377
Adjusted R	0.37		0.13		0.13		0.18		0.31		0.20	
R	0.52		0.35		0.35		0.38		0.48		0.40	

* = p < .05, ** = p < .01, *** = p < .001 n = 227

G. Degree of Occupational commitment

The 11 item scale of Career Commitment of Blau [63] is selected for this study. Finally 6 items are adapted with three reversed rated questions like "I did a mistake to choose this occupation." The reliability scale is found to be .75 (Mean= 24.0, SD= 5.5). A similar 6 point Likert scale is used for the employees to rate from a scale of very accurate =6 to very inaccurate =1. Details are in the appendix 1 G.

All the mean average value of the variables is used as separate variables in the analysis. A Likert scale of 6 point scale is used in the measurement of all the variables. The argument of using 6 point scale can be referred to previous studies conducted to analyze attitudes and behaviors of Japanese employees in Japanese workplaces. Japanese tend to "concentrate their responses in the neutral range of the scale..." [93]. Such orientations are outcomes of Japanese perception of collectivism which shape Japanese attitudes often constitute some biases to under report or over report their true feelings. They are more prone to give an average answer [94]. In the response sheet of the survey, neutral option as an answer has been purposefully avoided so as to compel the respondents to choose one answer denoting a degree of perceptions from either of the two directions provided as "accurate" or "inaccurate". The 6 points Likert scale as explained before: Very accurate = 6, Accurate = 5, Partially accurate = 4, Partially inaccurate = 3, Inaccurate = 2 and very inaccurate = 1 is applied to all measurement of items except 5 items in HPWS. Here only two options of accurate and inaccurate are provided.

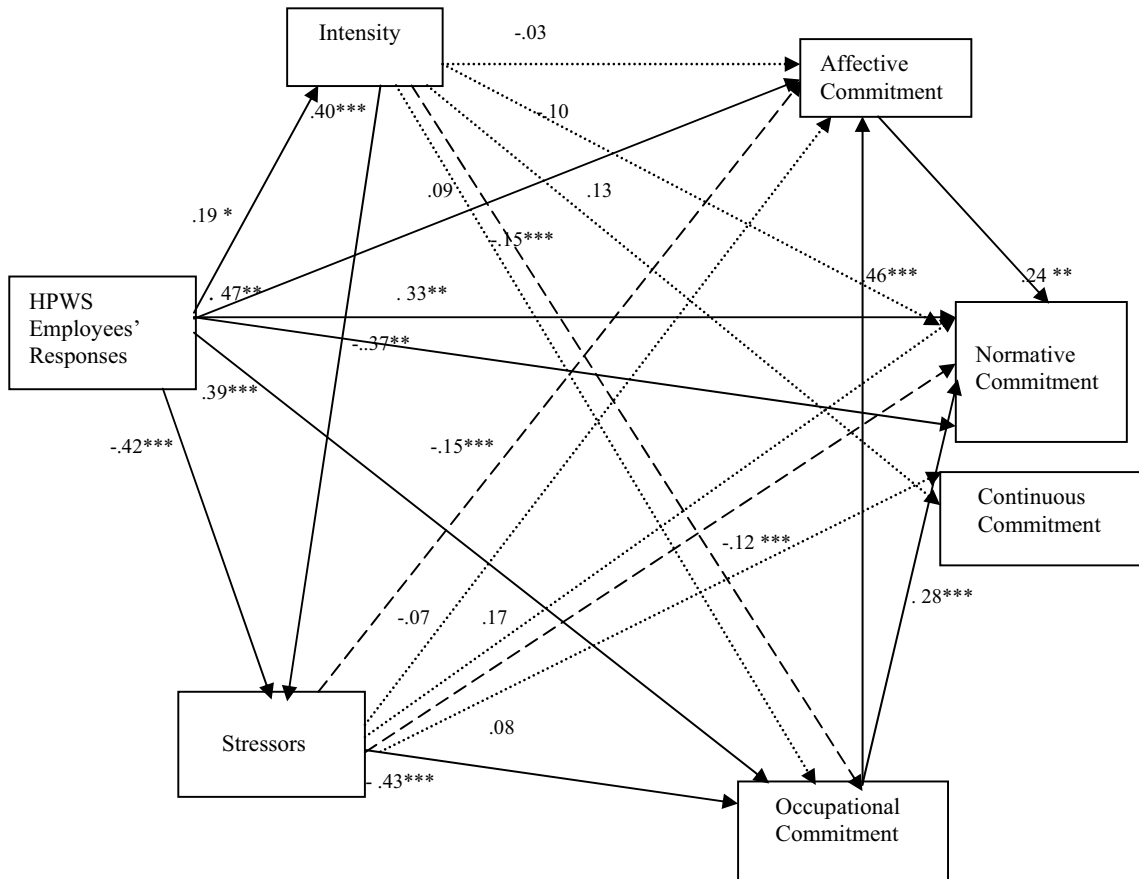
H. Control variables

The following six background variables are controlled in this study: (1) age (in terms birthday), years of service in the current organization (the actual number of years of each respondent), years of service in other organizations (1 is

assigned when a respondent has experienced job hopping, while 0 is assigned when he or she has not), number of employees in the workplace (company size) (measured in terms of the number of employees in each establishment), main bread earner (1 for yes, 0 for no) and number dependants (actual number).

IX. RESULTS

Correlation analysis in Table 1 indicates the descriptive statistics and inter-correlations between the control variables and the scale variables. The mean value and the standard deviation of each of the variable were calculated. Analyzing the frequency and histogram for all the scale variables revealed normal distribution. The correlation analysis shows a significant correlation between average mean responses of HPWS with each of the outcomes variables like Affective commitment with $r = .51$ ($p < .000$), Occupational Commitment with $r = .37$ ($p < .000$), Normative commitment with $r = .35$ ($p < .000$) but a significant negative correlation with Continuous Commitment with $r = -.25$ ($p < .000$). Similarly the other output variables namely Stressors are also found to be significantly correlated with HPWS with $r = -.32$ ($p < .000$) but Intensity has a positive correlation with $r = .14$ ($p < .05$). Control variables like the dummy variable of years of services in the other company are negatively correlated with HPWS with $r = -.34$ ($p < .000$). Similarly Age and number of employees in workplace also show a negative correlation with HPWS. Only workers working in the



—————> Direct path with significant relationship
> Not significant direct path
 - - - - -> Indirect (mediated) path with significant relationship (Bootstrap of 2000 samples corrected percentile method)

*** p < .001; ** = p < .01; * = p < .05 n=227
 GFI=.998 AGFI = .970 RFI= .952 NFI = .995 CFI= 1.0
 TLI= 1.0 RMSEA= .000(90% confidence interval =.000 to .126).

Fig. 1 SEM path analysis HPWS & employee behaviors

same company show positive correlation with HPWS with $r = .14$ ($p < .05$). There are high correlations amongst the dependent variables. Affective commitment has a positive significant correlation between Occupational commitment with $r = .60$ ($p < .000$) and with that of Normative commitment with $r = .42$ ($p < .000$) but has a significant negative correlation with the stressors with $r = -.34$ ($p < .000$). As expected a significant negative correlation was obtained between Affective and Continuous commitment $r = -.17$ ($p < .01$). There is a significant positive correlation between stressors and intensity with $r = .42$ ($p < .000$).

A multivariate analysis of covariance (MANCOVA) was performed to reduce the Type 1 error inflation for the studies with multiple dependant variables like in this study [95, 96]. SPSS version 14 was used to calculate the MANCOVA in this study. Accordingly a two step process was followed to test the hypotheses. A multivariate test was performed including all the variables to remove the non significant controlled variables. Box's M test of Equality Covariance = 450.61, $F = 1.06$ ($df_1=273.0$, $df_2 = 6223.7$) with a non significant $p = .23$ ($> .05$) suggested that assumption of normality was met in the model. Pillai's Trace statistic result was used as it is been acknowledged as most accepted robust statistics even in case of violation of model assumptions [97]. The first model show Control variables like Number of employees had Pillai's trace value 0.07 ($F=1.95$, $p = .08$), Main bread earner in the family had Pillai's Trace value of 0.07 ($F = 1.99$, $p = .07$), Number of Dependants had a Pillai's Trace value of .05 ($F = 1.35$, $p = .24$) were dropped being non significant from further analysis. The next step MANCOVA was repeated with the rest of Control variables leaving out the non significant control variables resulted from the first step. The new model also had non significant Box's M value showing assumption of normality was met and the model had no violation of assumptions. The results from the second step show Pillai's Trace statistic of all the remaining predictor variables were statistically significant. Control variables like Age had a value of .07 ($F = 2.20$, $p = .05$), Years of service in the current organization had a value of .10 ($F = 2.99$, $p = .01$) and the dummy variables of years of service in other companies had a value of .08 ($F = 2.30$, $p = .04$). But the significant contributor to the model was HPWS which had the Pillai's Trace statistic value of 2.078 ($F = 1.7$, $p = .000$).

Results of the MANCOVA test of subject effect between HPWS and outcomes in the Table 2 indicate that the Affective, Continuous, Occupational, Normative commitments are all significantly dependant to the mean average response of HPWS. The squared Partial Etas also confirmed that HPWS has the maximum influence to the different outcome dependant variables. Adjusted R shows that 37% of the variance in this model has a high significant relationship with HPWS. The model with Stressors is the next strongest model with the Adjusted R is having 31% variance explained along with dummy variable of years of service on other organizations is the only controlled variable significantly related along with high significance of HPWS. Job intensity is the next model having 20% variance explained. The controlled variable like years of service in the current organization has a minor significant relationship with job intensity. HPWS is found to have significant relationship to the Job intensity. Normative

commitment has 18% of variance explained and is significantly related to HPWS. Both Continuous and Occupational commitment has 13% variance with not so high significant relationship with HPWS. The model with Occupational commitment has a more significant relationship with the control variables with the age and years of service in the current organization. But the value of the squared partial etas of HPWS significantly contributed in all the models.

The MANCOVA regression coefficient parameter estimates for HPWS were analyzed with the different outcome dependant variables. The result with Affective commitment suggested ($B = 5.512$, $t = 7.152$, $S.E.= .77$, $p=.000$). And with Continuous commitment ($B = 4.586$, $t = 4.653$, $S.E. = .986$, $p = .000$), Occupational Commitment ($B = 6.212$, $t = 6.742$, $S.E. = .921$, $p = .000$), Normative commitment ($B = 6.087$, $t = 6.118$, $S.E.= 0.995$, $p = .000$), Stressors ($B = 1.730$, $t = 2.877$, $S.E. = .601$, $p = .005$), and finally Job Intensity showed the result ($B = 2.497$, $t = 3.200$, $S.E.= .780$, $p = .002$) which clearly revealed that all the variables were positively and statistically significant in relation with HPWS. This justified the additive effect of HPWS on all the dependant variables.

Analyzing the controlled variables in relation with the dependant variables resulted mixed results. None of the controlled variables has any significant relationship with Affective commitments and Normative commitment or with Continuous commitments of the employees. But with Occupational Commitment Age show a significant negative relationship ($B = -.265$, $t = -2.963$, $S.E.= .089$, $p = .003$) and Years of service in the current organization also have a significant negative relationship with Occupational commitment ($B = -.258$, $t = -2.757$, $S.E.= .094$, $p = .006$). Dummy variable of years of service in other companies has a significant positive relation with Stressors ($B = .301$, $t = 2.845$, $S.E.= .106$, $p = .005$) Years of service in the current organization has a negative relationship with the Job Intensity ($B = -.17$, $t = -2.10$, $S.E.=.08$, $p = .04$).

Then a multiple hierarchical OLS regression was also conducted to explore further relationship between HPWS and the outcome variables. The controlled variables used in the MANCOVA tests namely age, years of service in the current organization, and dummy variable of years of service in other organizations are entered initially to predict each of the outcome variables one by one using SPSS 14. Then in the next step HPWS mean average responses are entered to the model and lastly each of the dependant outcome variables are entered in to the equation. The strongest standardized regression coefficient depicting the strongest relationship between any two variables was used to run a structural equation modeling (SEM) using AMOS 5. A recursive causal model (Fig.1) with standardized regression weights with the arrows pointing to the variables as path coefficients was found. The derived model has a chi square $X^2(2, n = 227) = 1.697$ with $P = .428$ is not significant, suggesting the proposed model is consistent with the observed data. Relative Fit Index (RFI), Normal Fit Index NFI, Comparative Fit Index CFI, Tucker-Lewis Index TLI and Root mean square Error of Approximation RMSEA, were used along with model fitting prescribed by authors like Joreskog and Sorbom [98] Kline [99]. Goodness of Fit Index (GFI) and Adjusted GFI show a better fitness by Byrne [100]. The path

diagram shown in the FIGURE (1) satisfied all the criteria to be declared a fit model.

Assessing the path analysis of the model a significant direct effect are found between HPWS with Intensity ($\beta = .19$, $p = .03$), with Affective commitment ($\beta = .47$, $p = .000$), and with Normative commitment ($\beta = .33$, $p = .005$) and with Occupational commitment ($\beta = .39$, $p = .000$). However a direct but a negative effect with Stressors ($\beta = -.42$, $p = .000$) and also a significant negative effect with Continuous Commitment ($\beta = -.37$, $p = .004$) are found. Intensity has a significant direct effect to Stressors ($\beta = .40$, $p = .000$). A significant direct but negative effect is also found from Stressors to Occupational commitment ($\beta = -.43$, $p = .000$). There is also a significant direct relationship from Occupational commitment to Affective commitment in the model ($\beta = .46$, $p = .000$). There are no direct significant paths as depicted by the perforated arrows from Stressors to any of Affective, Continuous, and Normative commitment are found in the model. However a significant negative path is detected from Stressors to Occupational commitment ($\beta = -.43$, $p = .000$). Intensity on the other hand has no direct effects to any of the four types of commitments used in the data set.

A bootstrap analysis of 2000 samples was also conducted to test mediation effects of Stressors and Intensity on the four different forms of commitments in the data set. Stressors show a significant but negative indirect effect on Affective commitment ($\beta = -.15$, $p = .000$) and on Normative commitment ($\beta = -.12$, $p = .000$). This elaborated the hypotheses indicating the indirect (mediated) effect of Stressors on Affective commitment and Normative commitments. As Stressors would go up by 1 standard deviation both in the case of affective and normative commitments, both the forms of Commitments would go down by 0.15 and 0.12 standard deviations respectively. Intensity has a significant indirect negative path on Occupational commitment only ($\beta = -.15$, $p = .000$). When Intensity would go up by 1 standard deviation, Occupational commitment would go down by 0.15 standard deviations. There is however no indirect effect observed with Continuous commitment. The bootstrap approximation of the two mediations is obtained by constructing two-sided bias-corrected confidence intervals. These results show mediated effects of Stressors and job intensity to some forms of employee commitments to a certain extents.

X. DISCUSSIONS

The study show significant relationships of HPWS with all the outcome variables used in the sample. But a significant negative relationship is found with work place stressors and with Continuous commitment providing in a mixed result in support of hypotheses (i). The negative effect of continuous commitment finds support in the earlier works of Harley [101]. In his study in Australia he could not find a direct relationship between HPWS with either positive or negative effect to the employees. But found HPWS were negatively associated with employee continuance commitment. The MANCOVA analysis in this study shows clearly the additive effect of HPWS to all the outcomes proving the hypotheses (iv). To some extent the debate that HPWS often have a negative effect on employee

and it can affect to commitment levels of the employees could not satisfactorily established. HPWS is significantly related to job intensity ($p < .05$) in contrast to the findings of Kalmi and Kauhanen [26] but this has not posed any threat to affective, normative or to continuous commitments of the employees. Intensity and workplace stressors are significantly correlated and intensity has a significant direct path to stressors thus getting support for hypotheses (ii). A significant negative relationship is obtained from HPWS to Stressors. This finds supports to earlier works of Berg and Kalleberg [49] or Appelbaum *et al* [1] in their studies on workers in USA. The results from this study could be due to the construct of the variable of workplace Stressors as a single entity. This variable not only included the stressors evolving from the job function only but also situations arising from mistrust, dissatisfaction in jobs, unhealthy competition or human relationship, emotional distress and fear of losing face due to mistakes on jobs in workplaces. These results further justify that HPWS practices in Japanese workplaces foster healthy good relation involving high trust to the management and colleagues would experience high OCB with workers. These possibly offset the negative effect of high job intensity on the affective and continuous commitments in our study. This indirectly supports the theory that HPWS can provide win – win benefits for firms and employees as prescribed by Appelbaum *et al* [1]. Increase of HPWS practices could lead to higher trust, OCB learning environment, freedom in work thereby reducing the effect of overall intensified work load situations as a whole and thereby increasing more affective commitment of the employees. This supports indirectly to the earlier findings of Macky and Boxall [83]. Apprehensions of Green [102] that one should be cautious about implementing more HPWS practices as this could increase higher intensification which would increase stress in workers and which could lead to decrease in work-life balance of the workers as Ramsay *et al* [25] propounded could not be entirely established in this study. There could be a high perception on fairness regarding the management which played in the mindset of the employees that possibly build a sense of trust and high organizational commitment in HPWS workplaces as observed earlier by Guest [9]. The path analysis revealed that mediated (indirect) effect of low stressors actually increases high occupational commitment significantly and this justifies the argument of controlling stressful working conditions to increase employee commitment. This supported to the hypotheses (iii) partly as this study revealed that Intensity has played no mediated role on affective commitment. This study indirectly also provide evidences to support the earlier findings of Takeuchi *et al* [64] that HPWS has a significant relationship to high degree of social exchange perceived by the employees in Japan. It could be this high level of consciousness amongst the employees which prevent employees to perceive “felt stressed” in HPWS workplaces even when they felt job has intensified. In MANCOVA analysis we found that HPWS also has a significant higher relationship with the affective and normative commitment than continuous or occupational commitment. Earlier research in Japan by Kuratani and Kido [62] found high affective commitment and a low continuous commitment and level of normative commitment being the lowest amongst employees in non- private public organizations

in contrast to the mixed findings in this study. There are in not much of differences in the affective and continuous and occupational commitment but a lower level of normative commitment in the sample used for this study. But continuous commitment has less significance than the rest of the commitment forms in relation to HPWS. Another revelation from the path study is that of occupational commitment being significantly related to affective commitment and not with continuous commitment. This find supports to earlier works of Rahman and Hanafiah [103], Wallace [104] and justifies that relationship of such forms of commitment largely depend upon with the attitudes of the employees and has several complicated dimensions. In this study a non-significant but positive relationship between stressors to occupational commitment is obtained thus partly supporting hypotheses (v). Stressors have a significant but negative relationship with occupational commitment but intensity has a indirect (mediated) relationship with occupational commitment thus providing a mixed result for hypotheses (vi). This study could not show a clear exploitive mechanism as perceived by the non managerial employees while implementing HPWS in Japanese organizations as argued by Ramsay *et al* [25] in their studies in UK. Even though this study has not conducted about the “felt strains” amongst the employees but it supports to his view of HPWS practices can intensify works to some extent in these workplaces.

XI. LIMITATIONS AND IMPLICATIONS

The sample size in the study is not representative of the entire population of the employees in Japan so in no way the result can be generalized. Randomization of the samples could not be applied yet efforts were made to collect data from multiple sources including union representatives of different organizations to remove biasness. But Japanese cultures normally restrict themselves and tend not to disclose their true feelings publicly as described earlier in this paper, so biasness in their perceptions cannot be ruled out especially during the time of recessions. No interaction effect of HPWS individual practices [105] are tested in this study which may have produced further interesting findings. The path analysis performed by SEM has tested relationships with the observed variables only in the dataset, ignoring the possible influences of the latent unobserved variables in the model. Thus all the causal linkages have not been fully explored and the results must be interpreted with cautions. Though the study revealed job intensity and stressors arising from HPWS could affect some form of employee commitments but an opposite phenomenon can also occur. There can be possibilities like affective and occupational commitment or normative commitment giving rise to stressful workplaces and may intensify jobs. Such complexities of intra-relationships of the variables used in this study are needed to be explored in further studies in different workplace settings near future.

APPENDIX 1 A
 MEASUREMENT OF HPWS

Items used	Cronbach's alpha if deleted
1. Selective recruitment	0.89
2. Training	0.88
3. Internal promotion systems	0.89
4. Empowered employees	0.88
5. Participation programs	0.88
6. Team work	0.88
7. Self- directed teams	0.88
8. Performance appraisal	0.89
9. Formal performance feedback	0.89
10. Regular constructive feedback	0.88
11. Performance based on quantified results	0.88
12. Profit sharing schemes	0.89
13. Additional pay rise in last year	0.89
14. Information sharing on company's financial and operational performance	0.88
15. Information sharing on co's strategic plans	0.88
16. Formal communication programs	0.88
17. Employee attitude surveys	0.89
18. Few Status differences	0.88
19. Good career opportunity	
20. Formal grievances and complaint resolution system.	0.89
21. Measures of occupational safety and injuries.	0.89

APPENDIX 1 B
 MEASUREMENT OF JOB INTENSITY

Items used	Cronbach's alpha if deleted
1. Work in free time also	0.80
2. Often have to stretch working day	0.49
3. Can't plan and work properly since too much urgent work	0.51
4. Don't have time to do my work as well as I want	0.53
5. Increase in speed of work and efforts	0.51

APPENDIX 1 C
 MEASUREMENT OF CONTINUOUS COMMITMENT

Items used	Cronbach's alpha if deleted
1. Not concerned if I leave this co without having any other job(r)	0.69
2. Would be very hard to leave this co right now	0.44
3. I work in this co because of the benefits I draw from this co unable to be found in any other co.	0.36

APPENDIX 1 D
 MEASUREMENT OF NORMATIVE COMMITMENT

Items used	Cronbach's alpha if deleted
1. Don't think sensible to be a company's man anymore (r)	0.70
2. Even if get a better job elsewhere I don't feel it right to leave my organization	0.41
3. A sense of moral obligation	0.38

APPENDIX 1 E
MEASUREMENT OF AFFECTIVE COMMITMENT

Items used	Cronbach's alpha if deleted
1. No feeling of family atmosphere (r)	0.89
2. Emotionally attached to my co	0.83
3. Working for this co has a personal meaning to me	0.81
4. Strong sense of belongingness	0.81
5. Feeling of this co's problem as my own personal problem	0.86
6. Plan to work in this co until retirement	0.84
7. Proud to work for this co.	0.82

APPENDIX 1 F
MEASUREMENT OF WORKPLACE/ JOB STRESSORS

Items used	Cronbach's alpha if deleted
1. Unfair treatment	0.86
2. Conflict of beliefs	0.85
3. Lack of support	0.86
4. Conflict between quantity and quality	0.86
5. Conflicting demands from boss and colleagues	0.86
6. Autocratic supervisor	0.86
7. Constant pressure in work no relaxation	0.85
8. Necessary to be faster than others in work	0.86
9. No spirit of collaboration but only competition	0.86
10. No time to help others who lack behind	0.86
11. Colleagues are not willing to share their expertise	0.87
12. No environment of constructive suggestions for improvement of the co	0.85
13. Don't have any time for my family	0.86
14. Conflicts in devotions between my work and my family	0.86
15. No social contacts with my colleagues	0.86
16. Job mentally and physically demanding	0.85
17. Often had to hide my true feeling	0.85
18. Managers do not encourage experiments and acknowledge mistakes (r)	0.86
19. No freedom in work	0.86
20. Rarely have times for celebrations with colleagues along with their families	0.86
21. Rarely have time for humor and fun with colleagues	0.86
22. Often feel tired	0.85
23. Emotionally feel exhausted in work	0.86
24. Confusion over job expectation	0.85

APPENDIX 1 G
MEASUREMENT OF OCCUPATIONAL COMMITMENT

Items used	Cronbach's alpha if deleted
1. If possible I would like to go to different occupations (r)	0.68
2. Did a mistake to choose this occupation (r)	0.72
3. No money need still continue this job	0.77
4. Dissatisfied with my occupation (r)	0.73
5. Like this occupation too well to give up	0.69
6. Ideal occupation	0.69

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