Original Article

Personality profile of an air traffic controller

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Fifty nine well motivated and healthy Air Traffic Control Officers (ATCO), fifty one ATCO male and female trainees from Air Traffic Control Officers Training Establishment and twenty seven Administrative Officer (Admin) trainees from Ground Duty Officer's Training Academy, Air Force Academy, Hyderabad were assessed on an objective personality test for the purpose of finding out if there existed any gender difference on personality traits and to draw-up typical personality profiles of ATCOs, male and female ATCO trainees. Implications of the findings are discussed.

Keywords: Air traffic control, personality traits, gender difference, typical personality profile.

Introduction

An Air Traffic Control Officer (ATCO) provides the safe, orderly and expeditious flow of air traffic in the air and on the ground. He/she controls the aircraft (a/c) in a simple, directive, centralised and perhaps even an authoritarian sense [1]. Air traffic control regime is becoming more and more demanding and it has an inherent potential for stress in terms of critical time to respond. The other causes for stress among the ATCOs are petty frustrations and worries of daily life, management of disputes, sustained long and irregular hours of duty, erratic food habits due to rapid change in shift work, unsafe weather, unreliable equipment and poor maintenance, heavy traffic volume, working environment including office-comforts, noise, location of the building, etc [2-10]. The job of ATCO is four times more stressful than that of pilots [11].

What qualities make a successful ATCO has been a fascinating question, indeed. Researchers have tried to find out a satisfactory answer. The studies based on 16 personality factors test revealed that ATCOs were high average in abstract thinking, ex-

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traversion, group conformity, perseverence, tough-mindedness, self-confidence, self-control, independence and low in anxiety [12-15].

In Western countries, considerable attention is being paid to the study of personality factors and stresses affecting the performance of ATCOs. In our country, characteristics of an ideal ATC are not studied in detail. Our selection procedure is mainly looking for an officer or a leader. The personality assessment carried out in Services Selection Boards is both extensive and intensive [16]. However, it does not adequately discriminate an ATCO from officers of other branches of the Armed Forces. Certainly the stresses faced and coped up by these different types of officers could be different in frequency and magnitude.

The supersonic age with high speed multi role and the technical sophistication of a/c has increased the stress of ATCO. Air trafic control is usually perceived as a challenging vocation that carries with it an above average level of responsibility. Automation is the order of the day; computer and technologically advanced radar scope are there to carry-out precise operations in the process of data analysis. Yet the dividing line between failure and success of a mission is drawn by the decision of an ATCO. Can his personality be similar to those of officers of other branches of Armed Forces? We may not be able to give a definite answer to this question. However, an effort has been made with the following objectives in mind:

(a) To delineate the personality profile of a typical ATCO.

(b) To find out if there exists any qualitative difference between the ATCO and trainees - both ATCO and Administrative Officer, in terms of personality factors and

(c) To compare the personality profile of female ATCO trainees with ATCOs and male ATCO trainees to find out if there exists any gender difference in personality traits.

Material and method

The sample consisted of 137 healthy and well motivated volunteers from Air Force Academy, Hyderabad. 110 were from Air Traffic Control Officer's Training Establishment including 59 ATCOs, 16 male ATCO trainees and 35 female ATCO trainees and 27 Aministrative Officer (admin) trainees from Ground Duty Officer's Training Academy. A question may arise as to why admin officers are taken for the study. The reason is that the Admin Branch was earlier the mother Branch for ATCO's too. Hence, the inclusion of Admin trainees mainly for comparative purpose.

Sixteen Personality Factor Questionnaire (16 PF) was utilized for the study. The test has been developed by Cattell [17-19]. It has been designed to functionally measure personality dimensions. It is comprehensive in coverage and gives information regarding an individual's standing in 16 Primary Factors (PF) and 4 Second Order Factors (SOF). The standard scoring procedure was used. Student's 't' test was employed for analysing the data.

Results and discussion

Table 1 shows the characteristics of the sample selected for the study. The mean age of ATCO is 30.71 years, ATCO trainees 24.30 years and admin trainees 23.65 yrs.

Table 2 represents 16 PF profiles in mean stens (groupwise) and the personality profile of broad groups are plotted in Fig. 1. Scores in 'Md' scale indicate that the subjects are generally frank and sincere in answering the personality questionnaire.

Table 1. Sample parameters

Group	Number	Mean age (yrs)	Age range (yrs)
ATCO	59	30.71	19 - 42
ATCO Trainees	51	24.30	20 - 33
Admin Trainees	27	23.65	21 - 32

Table 3 and fig. 1 compare the 16 PF mean stens of ATCOs with those of ATCO trainees. The former is lower in PF F($p < 0.01$) and SOF II ($P < 0.01$) than the latter. A typical ATCO is low average on the uptake, ambivert, accommodating, like to work with others, adequate in emotional stability and tends to respect established traditions and customs of the society. On the other hand, ATCO trainees tend to be extravert, little less introspective and like to work with others. Comparison of Admin trainees with ATCO (Tables 4 and fig. 2) reveals that Admin trainees tend to be extravert (while ATCOs are ambivert) and more assertive.

Table 2. 16 PF profiles in mean stens (groupwise)

PF	ATCO (n=59)	ATCO Trainee (n=51)			Admin Trainee (n=27)
		Male (n=16)	Female (n=35)	Combined (n=51)	
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
A	5.63 ± 1.81	6.31 ± 1.49	5.37 ± 1.80	6.27 ± 1.52	5.33 ± 1.64
B	4.86 ± 1.68	4.88 ± 1.71	4.43 ± 1.48	5.14 ± 1.78	3.96 ± 1.70
C	5.56 ± 2.08	5.44 ± 1.93	6.89 ± 2.01	5.09 ± 1.77	6.07 ± 1.64
E	6.17 ± 2.03	6.19 ± 1.91	7.08 ± 1.99	6.32 ± 1.81	7.15 ± 1.68
F	4.61 ± 1.97	5.50 ± 2.00	6.14 ± 1.88	5.59 ± 1.87	5.74 ± 1.56
G	5.75 ± 1.78	6.06 ± 1.77	6.00 ± 1.57	5.95 ± 1.62	5.15 ± 1.81
H	5.85 ± 1.84	6.06 ± 1.77	7.00 ± 1.63	6.05 ± 1.79	6.52 ± 1.40
I	5.07 ± 1.78	4.82 ± 1.91	3.21 ± 1.78	4.83 ± 1.80	5.11 ± 1.74
L	5.36 ± 2.06	4.88 ± 2.03	4.91 ± 1.92	5.14 ± 2.17	5.33 ± 1.84
M	5.88 ± 1.92	5.94 ± 2.02	4.82 ± 1.86	5.64 ± 1.84	4.96 ± 1.72
N	5.75 ± 1.64	5.63 ± 2.03	5.83 ± 1.65	5.36 ± 1.96	5.74 ± 1.68
O	5.95 ± 2.06	5.25 ± 2.21	3.83 ± 1.44	5.45 ± 2.06	4.96 ± 1.95
Q1	4.32 ± 1.57	5.06 ± 1.39	5.26 ± 1.69	5.00 ± 1.31	5.19 ± 1.44
Q2	5.41 ± 2.39	4.38 ± 1.31	4.83 ± 2.49	4.69 ± 2.19	5.26 ± 2.14
Q3	5.85 ± 1.61	6.50 ± 1.90	7.57 ± 2.00	6.32 ± 1.78	6.67 ± 2.14
Q4	5.90 ± 2.05	6.06 ± 2.14	3.86 ± 1.65	6.14 ± 1.88	5.33 ± 1.54
SOF					
I	5.59 ± 1.95	5.39 ± 2.46	3.20 ± 1.76	5.59 ± 2.20	4.66 ± 1.67
II	5.51 ± 2.03	6.64 ± 1.36	7.11 ± 1.88	6.63 ± 1.51	6.63 ± 1.67
III	5.65 ± 1.74	5.36 ± 1.30	7.32 ± 1.58	5.44 ± 1.39	6.63 ± 1.37
IV	5.29 ± 1.39	4.88 ± 1.73	5.47 ± 2.27	4.86 ± 1.59	5.97 ± 1.44
Md	6.47 ± 5.89	6.56 ± 1.41	5.89 ± 2.46	6.41 ± 1.44	6.30 ± 2.63

Table 3. Comparison of 16 PF mean stens (ATCO vs. ATCO trainee)

PF	ATCO (n=59) Mean ± SD	ATCO Trainee (n=51) Mean ± SD	'p'
A	5.63 ± 1.81	6.27 ± 1.52	NS
B	4.86 ± 1.68	5.14 ± 1.78	NS
C	5.56 ± 2.08	5.09 ± 1.77	NS
E	6.17 ± 2.03	6.32 ± 1.81	NS
F	4.61 ± 1.97	5.59 ± 1.87	< 0.05
G	5.75 ± 1.78	5.95 ± 1.62	NS
H	5.85 ± 1.84	6.05 ± 1.79	NS
I	5.07 ± 1.78	4.83 ± 1.80	NS
L	5.36 ± 2.06	5.14 ± 2.17	NS
M	5.88 ± 1.92	5.64 ± 1.84	NS
N	5.75 ± 1.64	5.36 ± 1.96	NS
O	5.95 ± 2.06	5.45 ± 2.06	NS
Q1	4.32 ± 1.57	5.00 ± 1.31	NS
Q2	5.41 ± 2.39	4.69 ± 2.19	NS
Q3	5.85 ± 1.61	6.32 ± 1.78	NS
Q4	5.90 ± 2.05	6.14 ± 1.88	NS
SOF			
I	5.59 ± 1.95	5.59 ± 2.20	NS
II	5.51 ± 2.03	6.63 ± 1.51	< 0.05
III	5.65 ± 1.74	5.44 ± 1.39	NS
IV	5.29 ± 1.39	4.86 ± 1.59	NS

Table 4. Comparison of 16 PF mean stens (ATCO vs. Admin trainee)

PF	ATCO (n=59) Mean ± SD	Admin Trainee (n=27) Mean ± SD	'p'
A	5.63 ± 1.81	5.33 ± 1.64	NS
B	4.86 ± 1.68	3.96 ± 1.70	< 0.05
C	5.56 ± 2.08	6.07 ± 1.64	< 0.05
E	6.17 ± 2.03	7.15 ± 1.68	< 0.05
F	4.61 ± 1.97	5.74 ± 1.56	< 0.01
G	5.75 ± 1.78	5.15 ± 1.81	NS
H	5.85 ± 1.84	6.52 ± 1.40	NS
I	5.07 ± 1.78	5.11 ± 1.74	NS
L	5.36 ± 2.06	5.33 ± 1.84	NS
M	5.88 ± 1.92	4.96 ± 1.72	< 0.01
N	5.75 ± 1.64	5.74 ± 1.68	NS
O	5.95 ± 2.06	4.96 ± 1.95	< 0.05
Q1	4.32 ± 1.57	5.19 ± 1.44	< 0.05
Q2	5.41 ± 2.39	5.26 ± 2.14	NS
Q3	5.85 ± 1.61	6.67 ± 2.14	< 0.05
Q4	5.90 ± 2.05	5.33 ± 1.54	NS
SOF			
I	5.59 ± 1.95	4.66 ± 1.67	< 0.05
II	5.51 ± 2.03	6.63 ± 1.67	< 0.05
III	5.65 ± 1.74	6.63 ± 1.37	< 0.01
IV	5.29 ± 1.39	5.97 ± 1.44	< 0.05

Table 5 and fig. 1 show the performance of ATCO trainees and Admin trainees. The former is higher in PFs A ($p < 0.05$), B ($p < 0.01$), Q4 ($p < 0.05$); SOF I ($p < 0.05$) and lower in PFs C ($p < 0.05$), E ($p < 0.05$) and SOF III ($p < 0.05$) than the latter. This indicates that Admin trainees are comparatively somewhat low on the uptake and more aggressive than the ATCO trainees.

Table 6 and fig. 2 show that female ATCO trainees are higher in PFs C ($p < 0.01$), E ($p < 0.05$), F ($p < 0.01$), H ($p < 0.01$), Q1 ($p < 0.01$) and Q3 ($p < 0.01$); SOFs II ($p < 0.01$), III ($p < 0.01$) and lower in PFs I ($p < 0.01$), M ($p < 0.01$), O ($p < 0.01$), Q4 ($p < 0.01$) and SOF I ($p < 0.01$) than the ATCOs. Compared to ATCOs, female ATCO trainees are more extravert and tough-minded, higher in confidence and ready in taking responsibilities, more stable and resilient, high on self-concept control and are better adjusted being free from anxiety (Table 6 and fig. 2). When performance of female ATCO trainee is compared with that of male ATCO trainee (Table 7 and fig. 3), more or less similar picture emerges. This only indicates that personality qualities of female ATCO trainee conforms more closely to personality profile of ATCO as depicted in earlier researches[12-15]. Thus, female ATCO trainee might prove to be better in air traffic control work in near future. Also, the present findings might supplement the existing selection criteria for ATCOs.

Fig. 1 Personality profiles of ATCO, ATCO trainee and Admin trainee

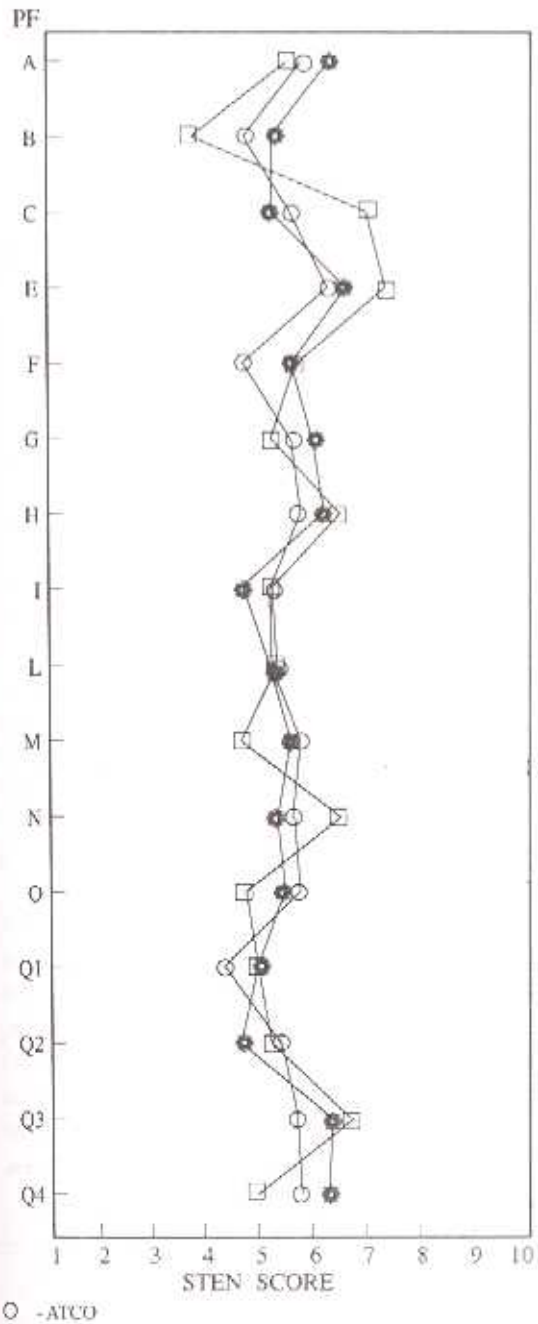

Fig. 2 Personality profiles of female ATCO trainee and ATCO

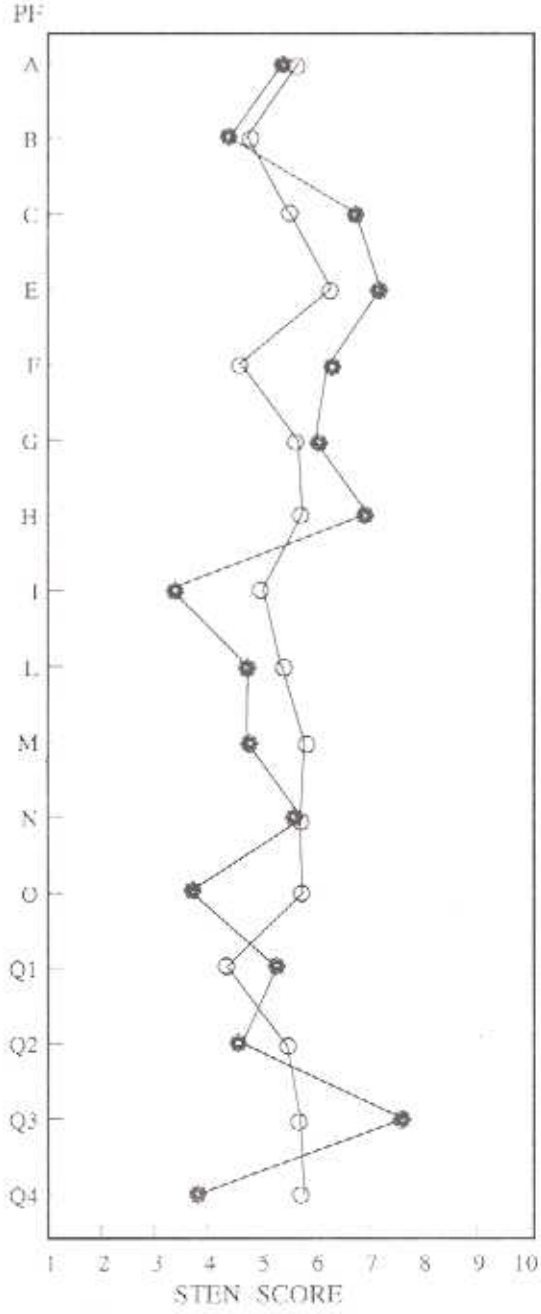

Fig. 3 Personality profiles of female and male ATCO trainee

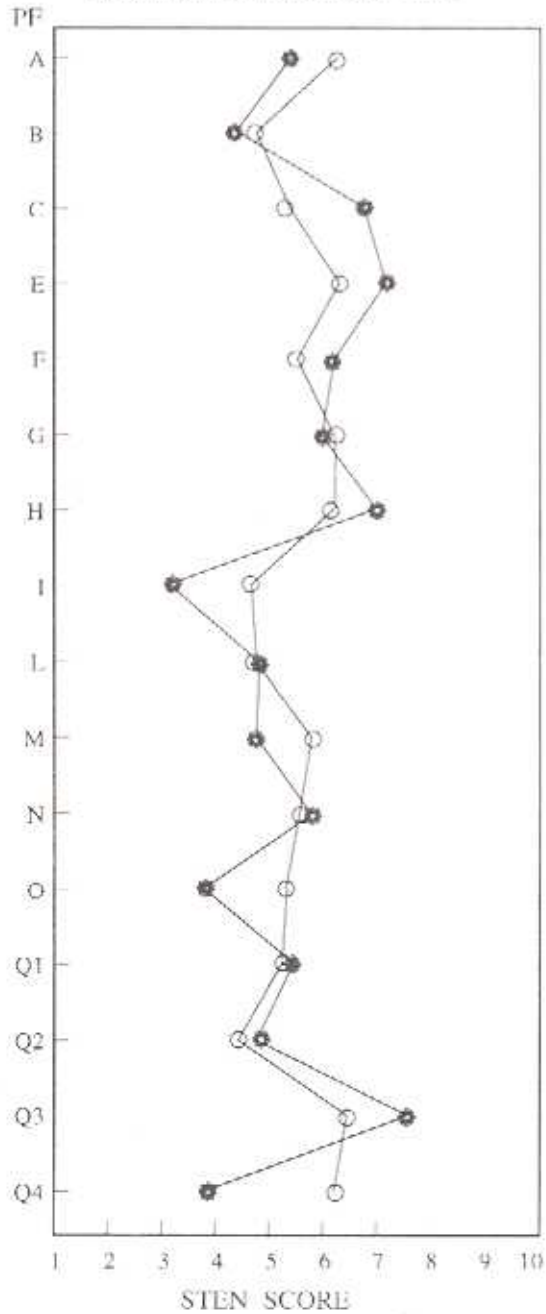

Table 5. Comparison of 16 PF mean stens (ATCO trainee vs. Admin trainee)

PF	ATCO trainee (n=54) Mean ± SD	Admin trainee (n=27) Mean ± SD	'p'
A	6.27 ± 1.52	5.33 ± 1.64	< 0.05
B	5.14 ± 1.78	3.96 ± 1.70	< 0.01
C	5.09 ± 1.77	6.07 ± 1.64	< 0.05
E	6.32 ± 1.81	7.15 ± 1.68	< 0.05
F	5.59 ± 1.87	5.74 ± 1.56	NS
G	5.95 ± 1.62	5.15 ± 1.81	NS
H	6.05 ± 1.79	6.52 ± 1.40	NS
I	4.83 ± 1.80	5.11 ± 1.74	NS
L	5.14 ± 2.17	5.33 ± 1.84	NS
M	5.64 ± 1.84	4.96 ± 1.72	NS
N	5.36 ± 1.96	5.74 ± 1.68	NS
O	5.45 ± 2.06	4.96 ± 1.95	NS
Q1	5.00 ± 1.31	5.19 ± 1.44	NS
Q2	4.69 ± 2.19	5.26 ± 2.14	NS
Q3	6.32 ± 1.78	6.67 ± 2.14	NS
Q4	6.14 ± 1.88	5.33 ± 1.54	< 0.05
SOF			
I	5.59 ± 2.20	4.66 ± 1.67	< 0.05
II	6.63 ± 1.51	6.63 ± 1.67	NS
III	5.44 ± 1.39	6.63 ± 1.37	< 0.05
IV	4.86 ± 1.59	5.97 ± 1.44	NS

Conclusions

The personality profile of a typical ATCO is delineated. Minor qualitative differences exist among ATCOs, ATCO trainees (combined) and Admin trainees in terms of personality factors. The personality make-up of an average female ATCO trainee, compared to those of the other groups, is more in consonance with salient personality qualities of effective ATCOs revealed through various studies.

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Table 6. Comparison of 16 PF mean stens (female ATCO trainee vs. ATCO)

PF	ATCO (n=59)	Female ATCO trainee (n=35)	'p'
	Mean ± SD	Mean ± SD	
A	5.37 ± 1.80	5.63 ± 1.81	NS
B	4.43 ± 1.48	4.86 ± 1.68	NS
C	6.89 ± 2.01	5.56 ± 2.08	< 0.01
E	7.08 ± 1.99	6.17 ± 2.03	< 0.05
F	6.14 ± 1.88	4.61 ± 1.97	< 0.01
G	6.00 ± 1.57	5.75 ± 1.78	NS
H	7.00 ± 1.63	5.85 ± 1.84	< 0.01
I	3.21 ± 1.78	5.07 ± 1.78	< 0.01
L	4.91 ± 1.92	5.36 ± 2.06	NS
M	4.82 ± 1.86	5.88 ± 1.92	< 0.01
N	5.83 ± 1.65	5.75 ± 1.64	NS
O	3.83 ± 1.44	5.95 ± 2.06	< 0.01
Q1	5.26 ± 1.69	4.32 ± 1.57	< 0.01
Q2	4.83 ± 2.49	5.41 ± 2.39	NS
Q3	7.57 ± 2.00	5.85 ± 1.61	< 0.01
Q4	3.86 ± 1.65	5.90 ± 2.05	< 0.01
SOF			
I	3.20 ± 1.76	5.59 ± 1.95	< 0.01
II	7.11 ± 1.88	5.51 ± 2.03	< 0.01
III	7.32 ± 1.58	5.65 ± 1.74	< 0.01
IV	5.47 ± 2.27	5.29 ± 1.39	NS

Table 7. Comparison of 16 PF mean stens (ATCO trainees female vs male)

PF	ATCO trainees		'p'
	Male (n=16)	Female (n=35)	
	Mean ± SD	Mean ± SD	
A	5.37 ± 1.80	6.31 ± 1.49	< 0.05
B	4.43 ± 1.48	4.88 ± 1.71	NS
C	6.89 ± 2.01	5.44 ± 1.93	< 0.05
E	7.08 ± 1.99	6.19 ± 1.91	NS
F	6.14 ± 1.88	5.50 ± 2.00	NS
G	6.00 ± 1.57	6.06 ± 1.77	NS
H	6.00 ± 1.57	6.06 ± 1.77	NS
I	3.21 ± 1.78	4.82 ± 1.91	< 0.01
L	4.91 ± 1.92	4.88 ± 2.03	NS
M	4.82 ± 1.86	5.94 ± 2.02	NS
N	5.83 ± 1.65	5.63 ± 2.03	NS
O	3.83 ± 1.44	5.25 ± 2.21	< 0.05
Q1	5.26 ± 1.69	5.06 ± 1.39	NS
Q2	4.83 ± 2.49	4.38 ± 1.31	NS
Q3	7.57 ± 2.00	6.50 ± 1.90	NS
Q4	3.86 ± 1.65	6.06 ± 2.14	< 0.01
SOF			
I	3.20 ± 1.76	5.39 ± 2.46	< 0.01
II	7.11 ± 1.88	6.64 ± 1.36	NS
III	7.32 ± 1.58	5.36 ± 1.30	< 0.01
IV	5.47 ± 2.27	4.88 ± 1.73	NS

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