



ISSN: 2456-0057
 IJPNPE 2019; 4(1): 2530-2534
 © 2019 IJPNPE
 www.journalofsports.com
 Received: 09-01-2019
 Accepted: 12-03-2019

Sachin Dogra
 Guru Nanak Dev University,
 Amritsar, Punjab, India

Rakesh Kumar
 Department of Physical
 Education, University of
 Jammu, Jammu & Kashmir,
 India

Construction of norms of skill related component of physical fitness of University ST

Sachin Dogra and Rakesh Kumar

Abstract

The present study was conducted to construct norms for selected Skill related components of students of department of physical education. For the purpose of the present study, Ninety Six (N=96), male students of department of physical education, Guru Nanak Dev University, Amritsar between the age group of 18-28 years were selected as subjects. The 50 meter dash test was used to measure speed, shuttle run test was used to measure agility, overhead medicine ball throw test was used to power, nelson scale test was used to measure, reaction time alternate wall toss test was used to measure, co-ordination and standing balance test was used to measure the balance. The data, which was collected by administering tests, was statistically treated to develop for all the test items. In order to construct the norms, Percentile Scale was used. Further, the scores were classified into five grades i.e., very good, good, average, poor and very poor. In Speed, the mean score was 8.02 and standard deviation score was 7.43. In Agility, the mean score was 11.40 and standard deviation score was 1.47. In Power the mean score was 7.85 and standard deviation score was 1.67. In Balance the mean score was 43.09 and standard deviation score was 7.67. In Co-ordination, the mean score was 24.69 and standard deviation was 6.61. In Reaction Time the mean score was 8.57 and standard deviation was 3.26 of students of department of physical education, Guru Nanak Dev University, Amritsar.

Keywords: Norms, speed, agility, power, balance, co-ordination and reaction time

1. Introduction

In physical education evaluation plays a vital role since beginning. The phase of physical education and sports process is concerned with test, measurement and evaluation. The possible associations of physical activity and exercise with cognitive functioning and academic performance in children and adolescents has been increasingly investigated in recent years (Donnelly *et al.*, 2016; Haapala *et al.*, 2016; Hillman, Erickson, & Hatfield, 2017; Van der Niet, Hartman, Smith, & Visscher, 2014) [5, 6, 7, 13]. Although there has been research performed on this topic for many years (see, for example, Ayres, 1965) [1], the renewed interest may be caused by concern that today's children do not maintain appropriate levels of physical activity and physical fitness (Tremblay *et al.*, 2011) [12], and there have also been reports of declining motor competence (Bardid, Rudd, Lenoir, Polman, & Barnett, 2015; Kambas *et al.*, 2012) [2]. Despite the known benefits to health outcomes (Janssen & LeBlanc, 2010; Timmons *et al.*, 2012) [8], evidence suggests that many children do not meet the recommended amount of daily physical activity (Kolle, Steene-Johannessen, Andersen, & Anderssen, 2010; Verloigne *et al.*, 2012) [9]. In addition, evaluation of education systems worldwide by testing children's skills and knowledge in important key subjects may have increased the focus on academic results and efforts to improve the educational systems. Several mechanisms related to changes in brain structure and cognitive function have been discussed when explaining the possible effects of physical activity on brain health in children (for a complete overview, see reviews by (Donnelly *et al.*, 2016; Hillman *et al.*, 2017; Voelcker-Rehage & Niemann, 2013) [5, 7, 15]. The constructs of physical activity, physical fitness, cardiovascular fitness, and motor competence are interrelated, but the results indicate that these different aspects of exercise and activity are differently associated with the brain structure, cognition, and function (Haapala, 2013; Voelcker-Rehage & Niemann, 2013) [6, 15]. Higher physical fitness and higher cardiovascular fitness in children has been related to a larger volume of the subcortical structures such as the basal ganglia and hippocampus (Chaddock *et al.*, 2010, 2012) [4];

Corresponding Author:
Sachin Dogra
 Guru Nanak Dev University,
 Amritsar, Punjab, India

additional evidence suggests that children who are more fit have a higher integrity of white matter microstructure and cortical thickness (see Hillman *et al.*, 2017) [7]. These structures are related to the modulation of executive control such as inhibition, memory, cognitive flexibility, and attention, which are cognitive operations that often are referred to as “gate keepers” to learning and academic achievement (Voelcker-Rehage & Niemann, 2013) [15].

More recently, studies on the association between motor coordination and cognitive function in children have emerged (Haapala *et al.*, 2015; Van der Fels *et al.*, 2014) [6, 14], but the link between this kind of research and specific brain structures and functions is unclear. According to Koutsandréou, Wegner, Niemann, and Budde (2016) [10], improvement of the working memory is significantly better for children undergoing motor exercise compared with a cardiovascular exercise training group and a control group. It is suggested that coordination and motor skill learning taps into the neurophysiological motor system to a greater extent than the metabolic processes involved in fitness and physical

activity, and that this has specific mechanistic effects on the brain structure and function via influence of the neural synapses and network (Koutsandréou *et al.*, 2016; Voelcker-Rehage & Niemann, 2013) [15]. The underlying mechanisms that are different between types of physical activity and brain structure/function are diverse and complex, and they are beyond the scope of the present study.

Reading is a skill that, in many societies, will determine success because decoding of written text to attain meaning is a prerequisite to gain knowledge from books. The reading process presupposes the graphemic encoding of visually presented words that in turn is recoded into speech and meaning is activated in semantic memory corresponding to comprehension (Revlin, 2013) [11].

2. Material and Methods

2.1 Selection of Subjects

For the purpose of the present study, Ninety Six (N=96), male students of Guru Nanak Dev university, Amritsar between the age group of 18-28 years were selected as subjects.

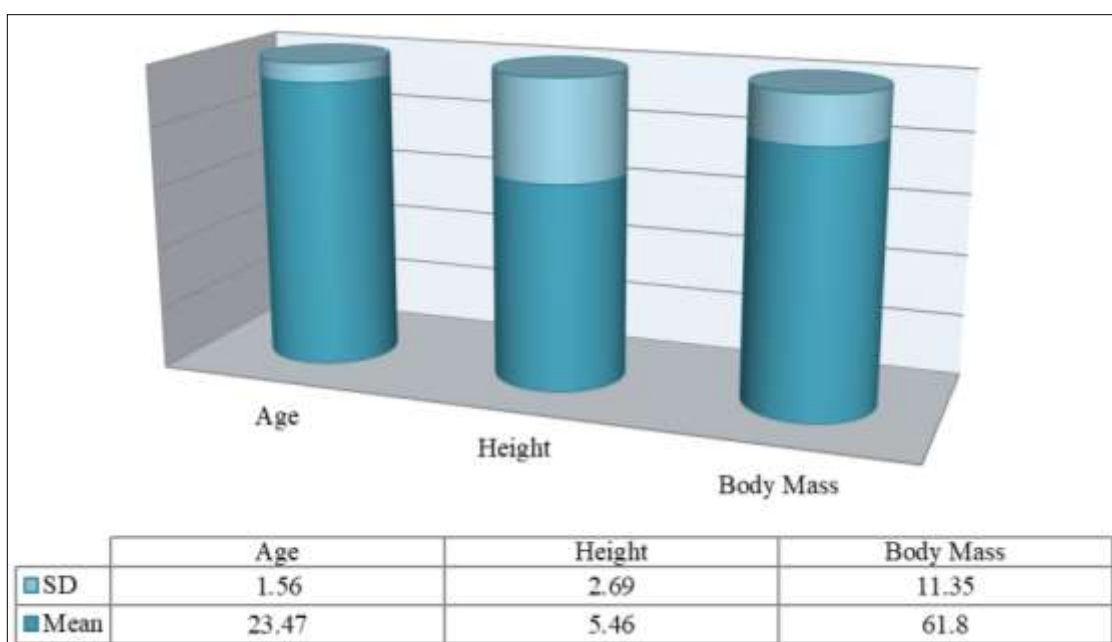


Fig 1: Subject’s Demographics of students of Guru Nanak Dev University, Amritsar (N=96).

3. Selection of Variables

A feasibility analysis as to which of the variables could be taken up for the investigation, keeping in view the availability of tools, adequacy to the subjects and the legitimate time that could be devoted for tests and to keep the entire study unitary and integrated was made in consultation with experts. With the above criteria’s in mind, the following skill related components were selected for the present study:

3.1 Skill related components

- i. Speed
- ii. Agility
- iii. Coordination
- iv. Balance

- v. Reaction time
- vi. Power

4. Statistical Analysis

The data, which was collected by administering tests, was statistically treated to develop for all the test items. In order to construct the norms, Percentile Scale was used. Further, the scores were classified into five grades i.e., very good, good, average, poor and very poor.

5. Results

For each of the chosen variable, the result pertaining to Descriptive Statistics (Mean & Standard Deviation) and Percentile Plot (Hi & Low) of selected Skill related components of students are presented in the following tables:

Table 1: Descriptive Statistics (Mean & Standard Deviation) and Percentile Plot (Hi & Low) of selected Skill related components of students of Guru Nanak Dev university, Amritsar (N=96).

Sr. No.	Variables	Mean ± Standard Deviation		Hi	Low
		Mean	SD		
1.	Speed	8.02	7.43	9.67	6.45

2.	Agility	Mean	11.40	14.58	8.97
		S.D	1.47		
3.	Power	Mean	7.85	11.12	4.17
		S.D	1.67		
4.	Balance	Mean	43.09	58.16	19.21
		S.D	7.67		
5.	Co-ordination	Mean	24.69	35	12
		S.D	6.61		
6.	Reaction Time	Mean	8.57	15.1	3.9
		S.D	3.26		

Table 1 shows that in Speed, the mean score was 8.02 and standard deviation score were 7.43. In Agility the mean score was 11.40 and standard deviation score was 1.47. In Power the mean score was 7.85 and standard deviation score was 1.67. In Balance the mean score was 43.09 and standard

deviation score was 7.67. In coordination the mean score was 24.69 and standard deviation score was 6.61. In Reaction time the mean score was 8.57 and standard deviation score was 3.26 of Guru Nanak Dev University, Amritsar (N=96) has been presented graphically in figure 2.

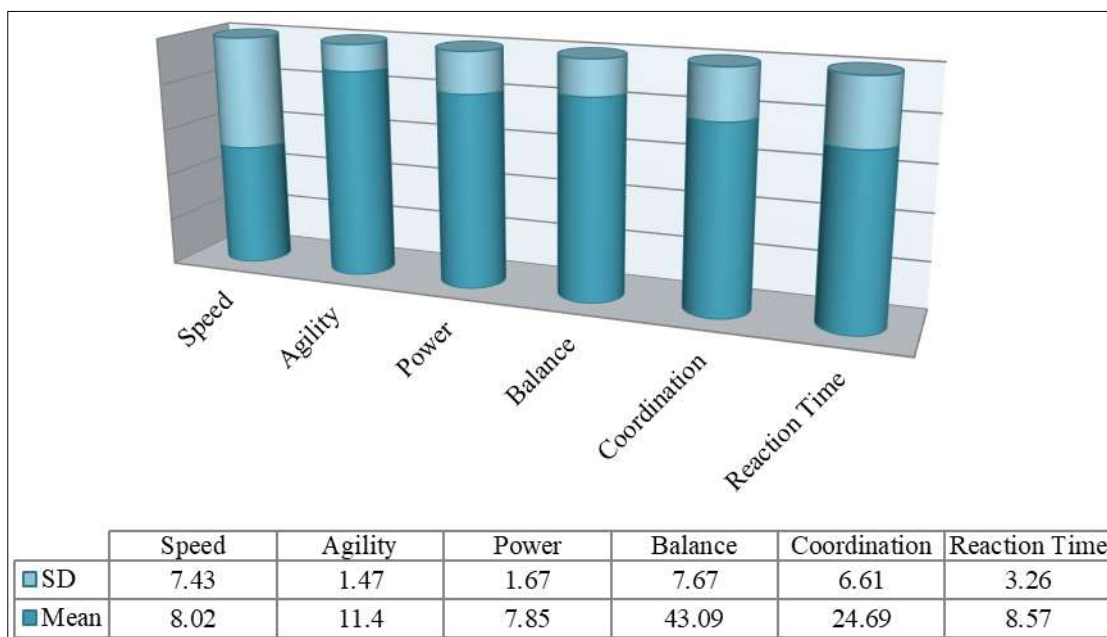


Fig 2: Descriptive Statistics (Mean & Standard Deviation) of selected Skills (i.e., speed, agility, power, balance, coordination, balance.) of skill related component of students of Guru Nanak Dev University, Amritsar (N=96).

Table 2: Grading for the selected skill related component of students of Guru Nanak Dev University, Amritsar (N=96).

Variables	Very Poor	Poor	Average	Good	Very Good
Speed	Greater than (>) 22.88	22.88-15.45	15.45-0.59	0.59- -6.84	Less than (<) -6.84
Agility	Greater than (>) 14.34	14.34-12.87	12.87-9.93	9.93-8.46	Less than (<) 8.46
Power	Less than (<) 4.51	4.51-6.18	6.18-9.52	9.52-11.19	Greater than (>) 11.19
Balance	Less than (<) 27.75	27.75-35.42	35.42-50.76	50.76-58.43	Greater than (>) 58.43
Coordination	Less than (<) 11.47	11.47-18.08	18.08-31.30	31.30-37.91	Greater than (>) 37.91
Reaction time	Greater than (>) 15.09	15.09-11.83	11.83-5.31	5.31-2.05	Less than (<) 2.05

The values listed in table 2 gives a guide to expected scores for skill related components of Students (N=96) of Guru Nanak Dev University, Amritsar for speed, Agility, power, balance, coordination, and reaction time. In speed the scores above than 22.88 are considered very poor from about 22.88-15.45 is considered poor 15.45-0.59 is considered average 0.59- -6.84 is considered good and the scores below than -6.84 are considered very good. In agility, the scores above 14.34 are considered very poor from about 14.34-12.87 is considered poor 12.87-9.93 is considered average 9.93-8.46 is considered good and the scores below 8.46 are considered very good. In power the scores below 4.51 are considered very poor from about 4.51-6.18 is considered poor 6.18-9.52 is considered average 9.52-11.19 is considered good and the

scores above 11.19 are considered very good. In balance the scores below 27.75 are considered very poor from about 27.75-35.42 is considered poor 35.42-50.76 is considered average 50.76-58.43 is considered good and the scores above 58.43 considered very good. In coordination, the scores below 11.47 are considered very poor from about 11.47-18.08 is considered poor 18.08-31.30 is considered average 31.30-37.91 is considered good and the scores above 37.91 are considered very good. In reaction time the scores above 15.09 are considered very poor from about 15.09-11.83 is considered poor 11.83-5.31 is considered average 5.31-2.05 is considered good and the scores below 2.05 are considered very good.

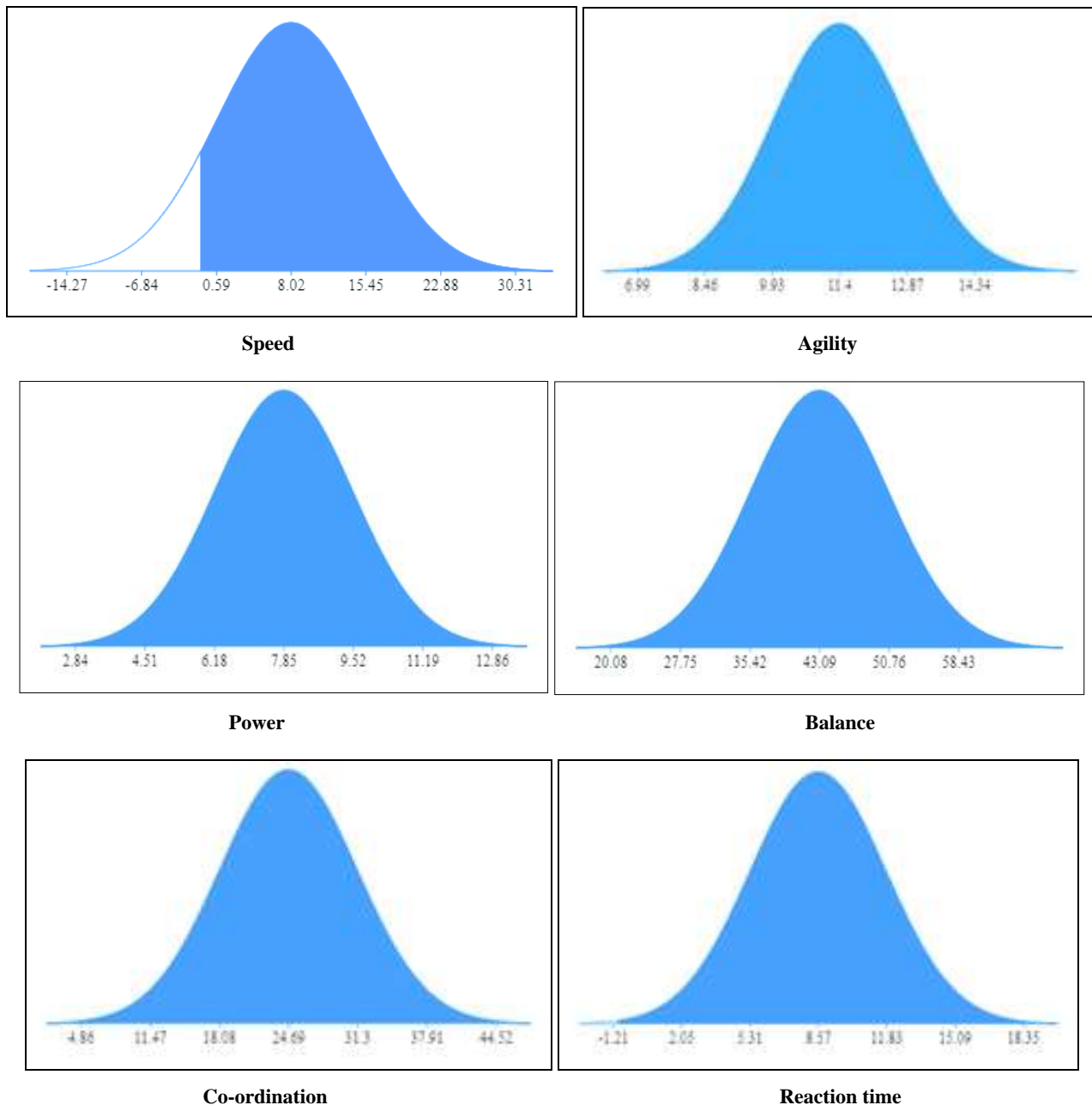


Fig 3: Normal distribution of selected skill related component (i.e., speed, agility, power, balance, coordination, balance.) of students of Guru Nanak Dev University, Amritsar (N=96).

6. Conclusions

To conclude, it is evident that in speed the scores above 22.88 are considered very poor from about 22.88-15.45 is considered poor 15.45-0.59 is considered average 0.59- -6.84 is considered good and the scores below than -6.84 are considered very good.

To conclude, it is evident that in agility, the scores above 14.34 are considered very poor from about 14.34-12.87 is considered poor 12.87-9.93 is considered average 9.93-8.46 is considered good and the scores below 8.46 are considered very good.

To conclude, it is evident that in power the scores below 4.51 are considered very poor from about 4.51-6.18 is considered poor 6.18-9.52 is considered average 9.52-11.19 is considered good and the scores above 11.19 are considered very good.

To conclude, it is evident that in balance the scores below 27.75 are considered very poor from about 27.75-35.42 is considered poor 35.42-50.76 is considered average 50.76-58.43 is considered good and the scores above

58.43 are considered very good.

To conclude, it is evident that in coordination, the scores below 11.47 are considered very poor from about 11.47-18.08 is considered poor 18.08-31.30 is considered average 31.30-37.91 is considered good and the scores above 37.91 are considered very good.

To conclude, it is evident that in reaction time the scores above 15.09 are considered very poor from about 15.09-11.83 is considered poor 11.83-5.31 is considered average 5.31-2.05 is considered good and the scores below 2.05 are considered very good.

7. Recommendations

Physical education teachers, coaches and athletic trainers may utilize the findings of students.

The study can be broadened by involving players of different performance levels (i.e. state, national, and international).

A similar study may be undertaken using larger sample for overall better consistency of result.

8. Acknowledgements

Heartiest thanks and appreciation are extended to all players who served as subjects for this study and without whose help this study could not have been completed.

9. References

1. Ayres AJ. Patterns of perceptual-motor dysfunction in children: A factor analytic study (Monograph Supplement 1-V20). *Perceptual and Motor Skills* 1965;20:335-368.
2. Bardid F, Rudd JR, Lenoir M, Polman R, Barnett LM. Cross-cultural comparison of motor competence in children from Australia and Belgium. *Frontiers in Psychology* 2015;6:964.
3. Chaddock L, Erickson KI, Prakash RS, VanPatter M, Voss MW, Pontifex MB, *et al.* Basal ganglia volume is associated with aerobic fitness in preadolescent children. *Developmental Neuroscience* 2010;32:249-256.
4. Chaddock L, Hillman CH, Pontifex MB, Johnson CR, Raine LB, Kramer AF. Childhood aerobic fitness predicts cognitive performance one year later. *Journal of Sports Sciences* 2012;30:421-430.
5. Donnelly JE, Hillman CH, Castelli D, Etnier JL, Lee S, Tomporowski P, *et al.* Physical activity, fitness, cognitive function, and academic achievement in children: A systematic review. *Medicine & Science in Sports & Exercise*, Special Communication 2016, 1197-1222.
6. Haapala EA, Lintu N, Väistö J, Robinson LE, Viitasalo A, Lindi V, *et al.* Associations of physical performance and adiposity with cognition in children. *Medicine & Science in Sports & Exercise* 2015;47:2166-2174.
7. Hillman CH, Erickson KI, Hatfield BD. Run for your life! Childhood physical activity effects on brain and cognition. *Kinesiology Review* 2017;6(1):12-21.
8. Janssen I, LeBlanc AG. Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity* 2010;7:1-16.
9. Kolle E, Steene-Johannessen J, Andersen LB, Anderssen SA. Objectively assessed physical activity and aerobic fitness in a population-based sample of Norwegian 9- and 15-year-olds. *Scandinavian Journal of Medicine & Science in Sports* 2010;20:41-47.
10. Koutsandreu F, Wegner M, Niemann C, Budde H. Effects of motor versus cardiovascular exercise training on children's working memory. *Medicine & Science in Sports & Exercise* 2016;48:1144-1152.
11. Revlin R. *Cognition: Theory and practice*. New York, NY: Worth Publishers 2013.
12. Tremblay MS, LeBlanc AG, Janssen I, Kho ME, Hicks A, Murumets K, *et al.* Canadian sedentary behaviour guidelines for children and youth. *Applied Physiology, Nutrition, and Metabolism* 2011;36:59-64.
13. Van der Fels IM, teWierike SC, Hartman E, Elferink-Gemser MT, Smith J, Visscher C. The relationship between motor skills and cognitive skills in 4-16 year old typically developing children: A systematic review. *Journal of Science and Medicine in Sport* 2014;18:697-703.
14. Van der Niet AG, Hartman E, Smith J, Visscher C. Modeling relationships between physical fitness, executive functioning, and academic achievement in primary school children. *Psychology of Sport and Exercise* 2014;15:319-325.
15. Voelcker-Rehage C, Niemann C. Structural and

functional brain changes related to different types of physical activity across the life span. *Neuroscience & Behavioural Reviews* 2013;37:2268-2295.