COMPUTATIONAL DYNAMIC SUPPORT MODEL FOR SOCIAL SUPPORT ASSIGNMENTS AROUND STRESSED INDIVIDUALS AMONG GRADUATE STUDENTS

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Abstrak

Mengkonfigurasi sumber terbaik untuk prestasi keseluruhan yang optimum adalah salah satu topik yang mencabar dalam domain Sains Komputer. Dalam domain aplikasi penugasan sokongan sosial pintar untuk membantu individu yang mengalami stres, ia memerlukan aspek penting dalam mengkonfigurasi set input dan parameter yang mungkin untuk mendapatkan penyelesaian optimum dari kedua-dua model komputasi penyedia sokongan dan penerima. Walau bagaimanapun, algoritma konfigurasi yang sedia ada adalah secara rawak dan statik. Oleh itu, keputusan yang diperolehi adalah berbeza secara signifikan antara beberapa larian. Dalam konteks perspektif sokongan sosial, sokongan yang diberikan mungkin tidak mencukupi atau menimbulkan beban kepada penyedia. Oleh itu, kajian ini bertujuan untuk membangunkan algoritma konfigurasi dinamik untuk memberikan tugasan sokongan yang optimum berdasarkan maklumat yang dihasilkan oleh model komputasi penerima and penyedia sokongan sosial. Model komputasi yang mensimulasikan tingkahlaku penyedia dan penerima sokongan dan tingkah laku penerima telah dibangunkan untuk menghasilkan beberapa corak simulasi. Model ini menjelaskan dinamik tingkah laku penerima dan penyedia sokongan dan penyediaan dan dinilai menggunakan analisis keseimbangan dan pendekatan pengesahan logik automatik untuk 14 kes empirikal yang dipilih. Kemudian, algoritma konfigurasi dinamik dirancang untuk menggunakan kemungkinan pengusan sokongan berdasarkan keperluan penyediaan sokongan. Analisis kekomplesan algoritma digunakan untuk mengukur masa pelaksanaan dalam keadaan terburuk. Akhirnya, prototaip dibangunkan dan disahsahihkan dengan 30 pelajar siswazah. Kajian ini meneroka kemungkinan analisis komputasi dalam pemahaman eksplisit tentang bagaimana proses mencari dan memberi sokongan dapat diperoleh pada keadaan kes yang berbeza. Juga, kajian secara eksplisit menunjukkan stres psikologi penerima sokongan dapat dikurangkan setelah proses algoritma konfigurasi dinamik menentukan penyedia sokongan sosial terpilih dari ahli rangkaian sokongan sosial. Selanjutnya, kajian ini menyediakan kaedah alternatif untuk jurutera perisian dalam sistem pengurusan stres pintar untuk mengintegrasikan konsep berasaskan sokongan sosial sebagai salah satu mekanisme dalam menangani sokongan individu dengan stres yang berkaitan dengan kognitif.

Katakunci: Stress kognitif, Algoritma konfigurasi Dinamik, Penerima dan penyedia sokongan, Penugasan sokongan tidak formal, Pemodelan komputasi kognitif .

Abstract

Configuring the best resources for optimal overall performance is one of the challenging topics in Computer Science domains. Within the domain of intelligent social support assignment applications to help individuals with stress, it requires important aspects of configuring a possible set of input and parameters to obtain optimal solutions from both computational support provider and recipient models. However, the existing configuration algorithms are often randomized and static. Thus, their results can vary significantly between multiple runs. In the context of social support perspectives, the assigned support may not sufficient or cause a burden to the providers. Hence, this study aims to develop the dynamic configuration algorithm to provide an optimal support assignment based on information generated from both social support recipient and provision computational models. The computational models that simulate support providers and recipients behaviours were developed to generate several simulated patterns. These models explain the dynamics of support seeking and provision behaviours and were evaluated using equilibria analysis and automatic logical verification approaches for 14 selected empirical cases. Later, the dynamic configuration algorithm was designed to utilize possible support assignments based on support provision requirements. The algorithm complexity analysis was used to measure the execution time in the worst case. Finally, a prototype was developed and validated with 30 graduate students. This study allows to explore computational analysis in explicit comprehension of how seeking and giving support process can be obtained at different case conditions. Also, the study explicitly shows the psychological stress of support recipient can be reduced after the dynamic configuration algorithm process assigned selected social support providers from social support network members. Furthermore, this study provides an alternative method for software engineers in intelligent stress management systems to integrate social support-based concepts as one of the mechanisms in addressing the support of an individual with cognitive related stress.

Keywords: Cognitive stress, Dynamic configuration algorithm, Support recipient and providers, Informal support assignment, Computational cognitive modelling .

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CHAPTER ONE

INTRODUCTION

1.1 Introduction and Background Study

Psychological stress has been identified by The World Health Organization (WHO) report as one of the modern-day killer epidemics and leading worldwide sources of years of well-being lost to illness in both women and men (Rogers et al., 2018; Herrera et al., 2017). This includes several physiological and mental issues related to stress diseases (Craven, 2016; Brown, 2015). Regarding the study, stress made a substantial contribution to the global burden of illness and connected to the loss of around 750,000 lives each year (Pavalanathan, 2018). For example, in Malaysia alone, almost 80 percent of employees experienced an increase in stress-related sickness (Wang et al., 2016). Without control and proper intervention, stress yields generous economic costs, in terms of both the budgets of well-being and social consideration and from different costs like the loss of workdays.

Sadly, with the demanding and stressful modern life, although 69 percent of people in the population perceives that stress is a major problem, only 31 percent know how to handle successfully with it (Bashir & Ramay, 2018; Rosenquist et al., 2017; Doherty et al., 2015). Therefore, it is important to highlight that an individual with stress history requests assistance from others to prevent the potential risk of stress.

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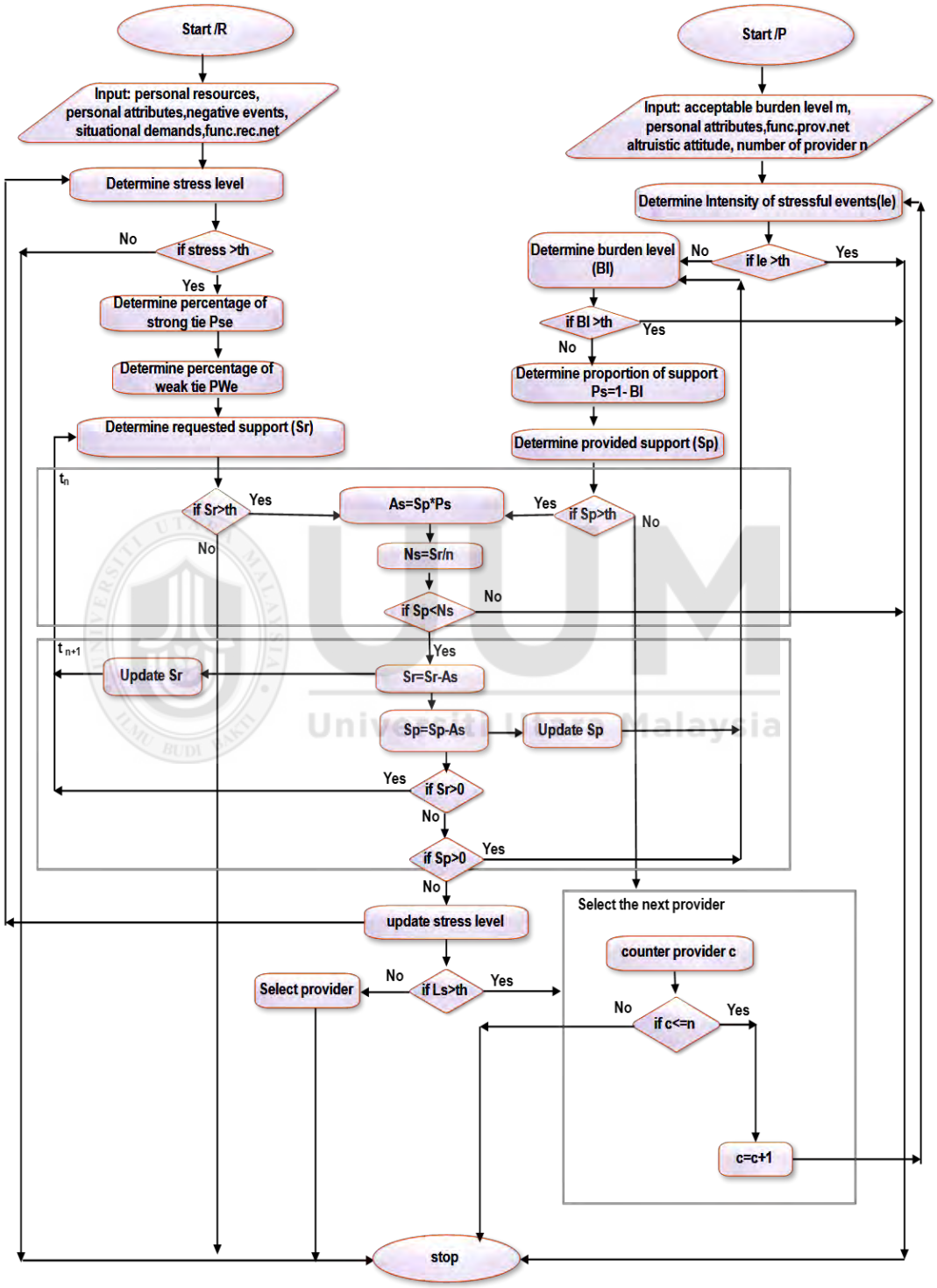
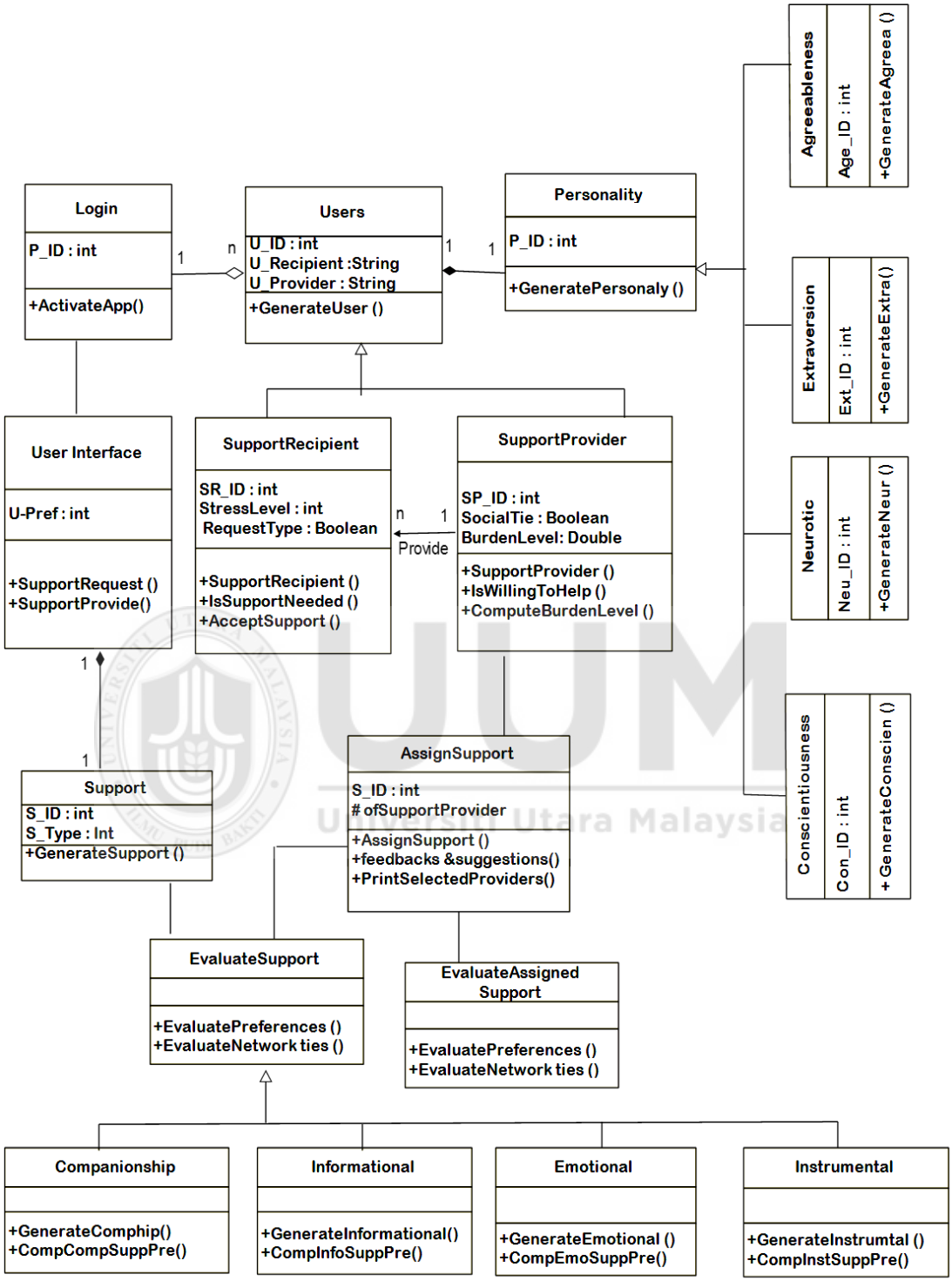
APPENDICES

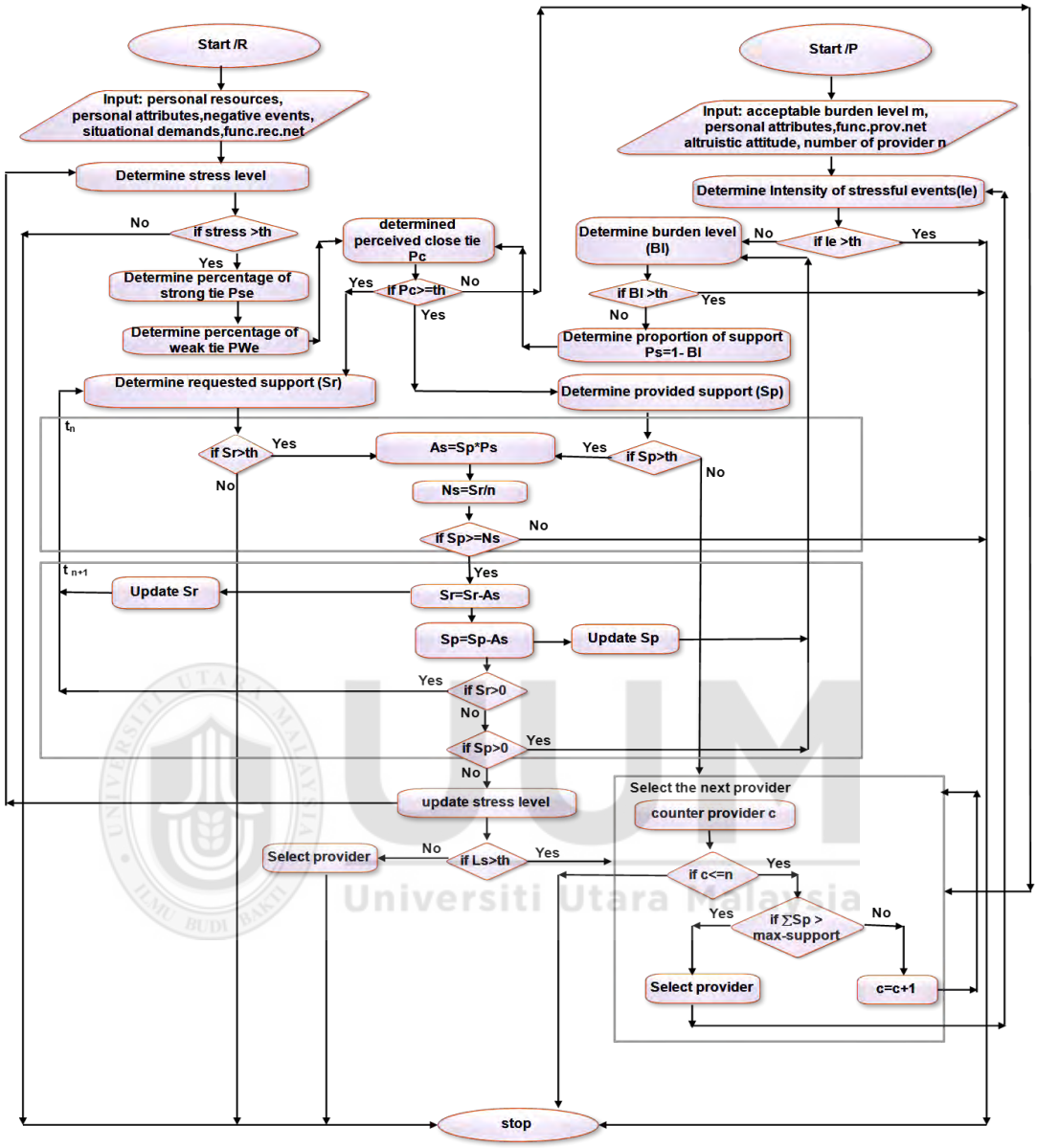
Appendix I: FLOW IN RANDOM SELECTION MODEL



Appendix II: CLASS DIAGRAM



Appendix III: FLOW IN PRIORITY SELECTION MODEL



Appendix IV: ONLINE QUESTIONNAIRE

UUM
Universiti Utara Malaysia

"Dynamic Support Model for Social Support Assignments"

[redacted]

You are asked to participate in a research study conducted by Roqia AL-Shorman, doctoral candidate, Azizi Ab Aziz, *Ph.D.*, and Rahayu Ahmad, *Ph.D.*, from School of Computing at Universiti Utara Malaysia (UUM). The result of this survey will be used as apart in the doctoral thesis for Roqia AL-Shorman. You were selected as a participant in this study because you have indicated that you are ready to provide feedback which is appreciated in designing configuration model. You should read the provided information below and ask questions about anything you don't understand before proceeding to participate. Your participation in this research is completely unpaid and you are free to decide whether to join or terminate at any point of the experimental period.

PURPOSE OF THE STUDY

The main goal of this experimental study is to evaluate the first prototype of social support assignment by determining the seeking and providing social support types and finally choose the appropriate providers from your social networks that can help you based on your request. It was developed to support stressed individuals. The obtained results of this experiment will help to validate to what extend the designed model is accepted and useful to help stressed individuals.

CONFIDENTIALITY

Any information that is obtained in connection with this questionnaire and that can be identified with you will remain confidential and will be used only for research purpose.

SECTION A: DEMOGRAPHIC DETAILS

Please mark (√) in the appropriate place provided.

1. Please indicate your gender?

☐ Male ☐ Female

2. Which of the following age categories do you belong to:

☐ <24 ☐ 25 - 34 ☐ 35 - 44

☐ > 45

3.Please identify your educational level?

☐ Ph.D. ☐ Master ☐ Diploma

☐ Undergraduate/ degree ☐ Others, Please state…….

4. Monthly income/ pocket money in ringgit Malaysia (**RM**/**MYR**)

☐ < 1000 ☐ 1000 -2000 ☐ 2001- 3000 ☐ 3001- 4000

☐ > 4000

5. What is the relationship between you and recipient (Just for support providers)?

☐ Parents ☐ Sister ☐ Brother

☐ Wife/Husband ☐ Close friend ☐ Friend

SECTION B: SEEKING SOCIAL SUPPORT

Instructions:

This scale is made up of a list of statements each of which may or may not be true about you. For each statement circle "strongly agree" if you are sure it is true about you and "agree" if You think it is true but are not absolutely certain. Similarly, you should circle "strongly disagree" if you are sure the statement is false and "disagree" if you think it is false but are not absolutely certain.

1. I see myself as dependable, self-disciplined.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree
2. I see myself as anxious, easily upset.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree
3. I see myself as open to new experiences, complex.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree
4. I see myself as reserved, quiet.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree
5. I see myself as extraverted, enthusiastic.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree
6. I see myself as sympathetic, warm.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree
7. I see myself as disorganized, careless.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree
8. I see myself as calm, emotionally stable.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree
9. I see myself as someone who is a reliable worker.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree
10. I see myself as conventional, uncreative.
    A) Strongly agree B) Agree C) Strongly disagree D) Disagree

11. I see myself as someone who makes plans and follows through with them.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

12. If I needed an emergency loan of RM100, there is someone (friend, relative, or Acquaintance) I could get it from.

A) Strongly agree B) Agree C) Strongly disagree D) Disagree

13. If I were sick, I could easily find someone to help me with my daily chores.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

14. It would be difficult to find someone who would lend me their car for a few hours.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

15. If I wanted to have lunch with someone, I could easily find someone to join me.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

16. If I needed a ride to the airport very early in the morning, I would have a hard time finding someone to take me.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

17. I found it hard to wind down
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

18. I tended to over-react to situations
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

19. I found myself getting agitated
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

20. I am as good at doing things as most other people are.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

21. I feel that I can share my most private worries and fears with.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

22. I don't often get invited to do things with others.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

23. I see myself as someone who is full of energy.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

24. I see myself as someone who is inventive.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree
25. I see myself as someone who tends to be organized.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree
26. I found it difficult to relax.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree
27. I had a major financial crisis.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree
28. I felt that I was using a lot of nervous energy.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

29. A close family member died (e.g. parent, brother, etc).
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

30. I felt that I was rather touchy.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

31. I was intolerant of anything that kept me from getting on with what I was doing
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

32. I see myself as critical, quarrelsome.
B) Strongly agree B) Agree C) Strongly disagree D) Disagree

SECTION C: PROVIDING SOCIAL SUPPORT

1. I can give information to help understand a situation.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree
2. I can give good advice about a crisis.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

3. I see myself as extraverted, enthusiastic.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

4. I see myself as critical, quarrelsome.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

5. I had a minor illness or injury like one needing a visit to a doctor or a couple of days off work.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree
6. There has been serious increase in arguments or problems with someone who lives at home.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree

7. I see myself as dependable, self-disciplined.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree
8. I studied for, or did, important exams.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree

9. I can listen to you when you need to talk.
   A) Strongly agree B) Agree C) Strongly disagree D) Disagree

10. I can confide in or talk to about yourself or your problems.
    A) Strongly agree B) Agree C) Strongly disagree D) Disagree

11. I take you to the doctor if you needed it.
    A) Strongly agree B) Agree C) Strongly disagree D) Disagree

12. I prepare your meals if you were unable to do it yourself.
    A) Strongly agree B) Agree C) Strongly disagree D) Disagree
13. I see myself as anxious, easily upset.
    A) Strongly agree B) Agree C) Strongly disagree D) Disagree
14. I have a good time with.
    A) Strongly agree B) Agree C) Strongly disagree D) Disagree

15. I can get together with for relaxation.
    A) Strongly agree B) Agree C) Strongly disagree D) Disagree

16. I can do things with to help you get your mind off things.
    A) Strongly agree B) Agree C) Strongly disagree D) Disagree

17. I show you love and affection.
    A) Strongly agree B) Agree C) Strongly disagree D) Disagree

18. I love and make you feel wanted.
    A) Strongly agree B) Agree C) Strongly disagree D) Disagree

19. If I wanted to have lunch with someone, I could easily find someone to join me
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

20. I see myself as reserved, quiet.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

21. I see myself as sympathetic, warm.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

22. I see myself as disorganized, careless.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

23. I see myself as someone who is helpful and unselfish with others
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

24. I see myself as calm, emotionally stable.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

25. I can be sympathetic and friendly.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

26. I see myself as someone who likes to cooperate with others.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

27. I see myself as conventional, uncreative.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

28. I am sometimes respectful to others.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

29. I see myself as someone who is interested about many different things.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

30. I see myself as someone who has an active imagination.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

31. I see myself as someone who values artistic, aesthetic experiences.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

32. I often can present my abilities.
A) Strongly agree B) Agree C) Strongly disagree D) Disagree

SECTION D: SATISFACTION WITH SOCIAL SUPPORT

Instructions:

The following questions ask about people in your life who provide you with help or support. Each question has two parts. For the first part, list all the people you know, excluding yourself, who you can count on for help or support in the manner described. Write the person's initials and their relation to you (see example). Do not list more than one person next to each of the numbers beneath the question. For the second part, circle how satisfied you are with the overall support you have. If you have no support for a question, circle the words "No one," but still rate your level of satisfaction. Do not list more than nine people per question. Please answer all the questions the best you can. All your responses will be kept confidential.

1. Who can you really count on to be dependable when you need help?

No one 1.) 2.) 3.)

4.) 5.) 6.)

2. How satisfied?

6 - Very satisfied 5 - fairly satisfied 4 - a little satisfied
3 - a little dissatisfied 2 – fairly dissatisfied 1- very dissatisfied

3. Who can you really count on to help you feel more relaxed when you are under pressure or tense?

No one 1.) 2.) 3.)

4.) 5.) 6.)

4. How satisfied?

6 - Very satisfied 5 - fairly satisfied 4 - a little satisfied
3 - a little dissatisfied 2 – fairly dissatisfied 1- very dissatisfied

5. Who accepts you totally, including both your worst and best points?

No one 1.) 2.) 3.)

4.) 5.) 6.)

6. How satisfied?

6 - Very satisfied 5 - fairly satisfied 4 - a little satisfied
3 - a little dissatisfied 2 – fairly dissatisfied 1- very dissatisfied

7. Who can you really count on to care about you, regardless of what is happening to you?

No one 1.) 2.) 3.)

4.) 5.) 6.)

8. How satisfied?

6 - Very satisfied 5 - fairly satisfied 4 - a little satisfied
3 - a little dissatisfied 2 – fairly dissatisfied 1- very dissatisfied

9. Who can you really count on to help you feel better when you are feeling down-in-the-dumps?

No one 1.) 2.) 3.)

4.) 5.) 6.)

10. How satisfied?

6 - Very satisfied 5 - fairly satisfied 4 - a little satisfied
3 - a little dissatisfied 2 – fairly dissatisfied 1- very dissatisfied

11. Who can you count on to console you when you are very upset?

No one 1.) 2.) 3.)

4.) 5.) 6.)

12. How satisfied?

6 - Very satisfied 5 - fairly satisfied 4 - a little satisfied
3 - a little dissatisfied 2 – fairly dissatisfied 1- very dissatisfied