

# The Psychology of Social Media Data



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## **Abstract**

This is where you write your abstract ...



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# **Chapter 1**

## **Introduction**

### **1.1 Introduction**

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### **1.3 Where does it come from?**



# Chapter 2

## Background

introduction to 4P,

Traits that are related to psychological disorders psychological disorder symptoms

### 2.1 Factors contributing to mental health

The 4P model is a biopsychosocial approach to analyze mental health development and progression []. The 4P model suggests that there are four types of factors contribute to development of all psychological disorders, each type of factors can be further divided into biological factors, psychological factors and social factors. The four types of factors are: predisposing risk factors, precipitating risk factors, perpetuating risk factors and protective factors.

Predisposing risk factors make an individual more susceptible to a psychological disorder. For example, genetic component, gender differences, personality traits and parental modeling. Precipitating risk factors contribute to the onset of psychological disorders, for instance, traumatic event or stressful life events. Perpetuating factors maintain the symptoms span from psychological disorders, such as chronic stress, cognitive bias, social stigma, social roles. Finally, protective factors build up the resilience of an individual []. Figure 2.1 demonstrates the relationships of these factors. Note that some of the precipitating factors can be perpetuating factors if they exist for a long time.

We attempt to study some of the factors via the lenses of social media platform. Social media behaviors reflect psychological and social factors to some extent but it's nearly impossible to inspect biological factors from social media data, except for gender differences. Another factor that is difficult to inspect in social media at this stage is childhood experience. As a result, my PhD project will only focus on inspecting factors that are available in social media data.

Table 2.1 Biopsychosocial Approaches in 4P Model

4P factor model	Biopsychosocial approach		
	biological factors	psychological factors	social factors
<b>Predisposing risk factors</b>	genetic, gender	personality traits, mood stability, self-disclosure, self-esteem, perfectionism, sensitivity to stress	parental modelling,
<b>Precipitating risk factors</b>	physical injuries	stress/trauma	change in family dynamics
<b>Perpetuating risk factors</b>	chronic diseases	chronic stress, malnutrition, crowding, pollution	social stigma, social roles, culture, social status
<b>Protective factors</b>	genetic	effective coping skills, high resilience, high cognition skills, high self-esteem, low sensitivity to stress	social support

### 2.1.1 predisposing factors

When individuals are exposed to a stressor, predisposing factors influence how people experience stress and how they cope with it. These factors affect an individual in the probability to encounter stressors. Note that people select their environment and shape them. They also affect people's tendency to react to situation and their tendency in coping. [] (Suls and Martin, 2005; Vollrath, 2001; cf. Watson, David and Suls, 1999)

#### personality

Consistent evidence has been found that some dimensions in personality co-occurred with certain mental disorders, but there's no direct link between personality and mental health problems. Personality is largely shaped by child-rearing practices and family interactions (cite). As a result, the link between personality and mental health can be traced back to family rearing style.

There are many types of personality models, such as, Myers–Briggs Type Indicator (MBTI), Cattell's 16 Factor Model, Big Five Model, among which the five factor personality model (Big5) is most widely adopted in personality studies. Big5 suggests five broad dimensions to describe human personality: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. There has been consistent evidence showing that personality plays an important role in the experience of stress. Individuals with high

neuroticism often experience more negative emotions (cite), and negative emotions affect how an individual cope with stress [2]. Neurotism has been found to be an increase risk factor for depression and anxiety. [4, 1] Internet addiction often occurs in introverted people [5]. However, personality and mental health do not have a direct causation relationship. There are many mediating factors between personality types and mental disorders. For example, rumination and worrying mediate neuroticism and depression [3];

### **self-disclosure**

Self-disclosure is the amount of information an individual disclose to significant others. There are three major parameters of self-disclosure: the amount of information disclosed; depth of the information disclosed and the time spent on describing the information. The evaluation of self-disclosure must involve the three parameters cite(self-disclosure, a literature review).

Self-disclosure is important to mental health problem because it affects one's help seeking behaviors. Individuals with high self-disclosure level are more likely to seek professional help (Hinson and Swanson, 1993). Self-disclosure is also a critical problem for psychotherapist. On one hand, patients often go to psychotherapy to seek solution to loneliness, which is a result of difficulty in building intimate relationships. One the other hand, patients wish to conceal themselves. (The Shared Experience and Self-Disclosure Martin Fisher, Self-Disclosure in the Therapeutic Relationship).

Self-disclosure is, again, shaped by the family rearing style. Fisher(1982) proposes that when infant/child involves in a communication with significant others, they receive positive or negative feedback. The feedback provided form a feedback loop. The positive feedback loop encourage a child to disclose more, whereas, the negative feedback loop does the opposite. Failing to disclose results in an accumulation of secrets, the greater the degree of secrets, the more alienation of self and others. cite() Besides family rearing style, self-disclosure is also affected by gender, culture, race and the relationship with the significant others.

### **self-esteem**

Self-esteem is the beliefs and evaluation individuals hold about themselves (Burns, 1982). These beliefs are inner influences that guild and government individuals through out their lives. The development of self-esteem is dependent on support and approval from significant others and self-perceived competence in the domains that are important to self. The distance between ideal self and real self is critical to the development of self-esteem cite. (Self-esteem in a broad-spectrum approach for mental health promotion)

Self-esteem is a protective factor in mental health because self-esteem and the ability to face challenge determine what happens to an individual in challenging situations. Conversely, poor self-esteem plays a critical role in the development of mental disorders. cit (Self-esteem in a broad-spectrum approach for mental health promotion). High self-esteem is related to better life satisfaction (Zimmerman, 2000). Self-esteem is a strong predictor of subjective well-being (Furnham and Cheng, 2000).

Whereas, Low self-esteem lead to maladjustment (Garmezy, 1984), depressed mood and depressive disorders (Rice et al., 1998; Dori and Overholser, 1999). Self-esteem alone has no direct contribution to depression, but self-esteem interact with accumulate stress highly predicts depression (Miller et al., 1989). Shin (Shin, 1993) found that when self-esteem, social support and cumulative stress are introduced to the regression analysis of depression, only self-esteem accounts for significant additional variance (cite).

### **gender and cultural differences**

A large amount of literature has found significant gender differences in depressive and anxiety disorders. Nevertheless, gender is an influential factor to help-seeking behavior. One one hand, women in genderal have higher self-disclosure level, thus they are more willing to seek help. On the other hand, gender stereotype such as women are prone to affective disorder and men are prone to substance use disorder also reinforce the stigma and affect the help seeking behaviors. Gender differences also exist in the comorbid rate of depression and anxiety cite(gender differences in mental health afifi M).

Cultural differences also influence the development of mental disorders. There are cultural bound syndromes, which are disorders that are more likely to occur in certain culture and context. For example, obesity and anorexia nervosa in the United States (OBESITY AS A CULTURE-BOUND SYNDROME ), social withdrawal in Japan (Hikikomori, a Japanese culture-bound syndrome of social withdrawal? A proposal for DSM-V). Cultural stigma also restraint the help-seeking behaviours of people from a certain culture. A person live in a culture full of stigmatizing image of mental health may internalize these ideas and suffer from a diminish in self-esteem and confidence(Corrigan, 1998; Holmes and River, 1998).

In summary, a lot of the predisposing factors, such as personality, self-disclosure and self-esteem, are dependent on family rearing style. It's nearly impossible to extract childhood information of a person from social media data, because social media only exploded in the recent decade. However, it's possible to extract information that reflects predisposing risk factors from social media data. As a result, my project will involve studying some of these disposing factors. Predisposing factors makes up the vulnerabilty of mental disorders, but



predisposing factors alone are not directly link to mental disorders. Their interaction with precipitating factors - stress, are most predictive of mental health.

### 2.1.2 precipitating factors and perpetuating factors

Life stress has been acknowledged as an important factors in illness onset (citation). It has been found that major life events, such as divorce, death of a closed friend or relative, being fired from work and so on are precipitating factors on mental illnesses (citation). However, the correlations between stress and health outcome is confound by many factors, such as the predisposing factors in the previous sections. As a result, the correlations between stress and health are modest ( $r = 0.2 - 0.4$ ) The correlations are much stronger among those who are already ill. cite (Aldwin and Gilmer, 2004).

#### measurement of stress

Most of the literature analyze stress from two perspective: psychological and environmental perspectives. The psychological perspective focuses on the individual's appraisal of their ability to cope with stress, while the environmental perspective focuses on the life events that cause the stress cite ((McGrath, 1970)).

**Scale that measurement stress and illness include Schedule of Recent Life Experiences (SRE)** , which is widely used to document the associations between stressful life events and diseases. The Social Readjustment Rating Scale (SRRS) measures the rating of life events in different sampling populations. five overlapping themes in the top 20 rated life events—death and dying, healthcare, crime and the criminal justice system, financial/economic issues, and family-related issues;

Type of stress

### **2.1.3 protective factors**

## **2.2 Types of psychological disorders and symptoms**

## **2.3 Social media data and its retrieval**

## **2.4 Analysis Techniques**

low social status increases the risk of being exposed to a number of adverse conditions, both physical and psychological (Adler, Marmot, McEwen and Stewart, 1999; Adler and Matthews, 1994).

# References

- [1] Raymond B Cattell and Ivan H Scheier. The meaning and measurement of neuroticism and anxiety. 1961.
- [2] Janice K Kiecolt-Glaser, Lynanne McGuire, Theodore F Robles, and Ronald Glaser. Emotions, morbidity, and mortality: new perspectives from psychoneuroimmunology. *Annual review of psychology*, 53(1):83–107, 2002.
- [3] Jeffrey Roelofs, Marcus Huibers, Frenk Peeters, Arnoud Arntz, and Jim van Os. Rumination and worrying as possible mediators in the relation between neuroticism and symptoms of depression and anxiety in clinically depressed individuals. *Behaviour Research and Therapy*, 46(12):1283–1289, 2008.
- [4] NJ Talley, LH Fung, IJ Gilligan, D McNeil, and DW Piper. Association of anxiety, neuroticism, and depression with dyspepsia of unknown cause: a case-control study. *Gastroenterology*, 90(4):886–892, 1986.
- [5] Huang Xiuqin, Zhang Huimin, Li Mengchen, Wang Jinan, Zhang Ying, and Tao Ran. Mental health, personality, and parental rearing styles of adolescents with internet addiction disorder. *Cyberpsychology, Behavior, and Social Networking*, 13(4):401–406, 2010.



# Appendix A

## How to install L<sup>A</sup>T<sub>E</sub>X

### Windows OS

#### TeXLive package - full version

1. Download the TeXLive ISO (2.2GB) from  
<https://www.tug.org/texlive/>
2. Download WinCDEmu (if you don't have a virtual drive) from  
<http://wincdemu.sysprogs.org/download/>
3. To install Windows CD Emulator follow the instructions at  
<http://wincdemu.sysprogs.org/tutorials/install/>
4. Right click the iso and mount it using the WinCDEmu as shown in  
<http://wincdemu.sysprogs.org/tutorials/mount/>
5. Open your virtual drive and run setup.pl

or

#### Basic MikTeX - T<sub>E</sub>X distribution

1. Download Basic-MiK<sub>T</sub>E<sub>X</sub>(32bit or 64bit) from  
<http://miktex.org/download>
2. Run the installer
3. To add a new package go to Start » All Programs » MikTeX » Maintenance (Admin)  
and choose Package Manager

4. Select or search for packages to install

### **TexStudio - T<sub>E</sub>X editor**

1. Download TexStudio from  
<http://texstudio.sourceforge.net/#downloads>
2. Run the installer

## **Mac OS X**

### **MacTeX - T<sub>E</sub>X distribution**

1. Download the file from  
<https://www.tug.org/mactex/>
2. Extract and double click to run the installer. It does the entire configuration, sit back and relax.

### **TexStudio - T<sub>E</sub>X editor**

1. Download TexStudio from  
<http://texstudio.sourceforge.net/#downloads>
2. Extract and Start

## **Unix/Linux**

### **TeXLive - T<sub>E</sub>X distribution**

#### **Getting the distribution:**

1. TeXLive can be downloaded from  
<http://www.tug.org/texlive/acquire-netinstall.html>.
2. TeXLive is provided by most operating system you can use (rpm,apt-get or yum) to get TeXLive distributions

## Installation

1. Mount the ISO file in the mnt directory

```
mount -t iso9660 -o ro,loop,noauto /your/texlive####.iso /mnt
```

2. Install wget on your OS (use rpm, apt-get or yum install)
3. Run the installer script install-tl.

```
cd /your/download/directory
./install-tl
```

4. Enter command 'i' for installation
5. Post-Installation configuration:  
<http://www.tug.org/texlive/doc/texlive-en/texlive-en.html#x1-320003.4.1>
6. Set the path for the directory of TexLive binaries in your .bashrc file

### For 32bit OS

For Bourne-compatible shells such as bash, and using Intel x86 GNU/Linux and a default directory setup as an example, the file to edit might be

```
edit ~/.bashrc file and add following lines
PATH=/usr/local/texlive/2011/bin/i386-linux:$PATH;
export PATH
MANPATH=/usr/local/texlive/2011/texmf/doc/man:$MANPATH;
export MANPATH
INFOPATH=/usr/local/texlive/2011/texmf/doc/info:$INFOPATH;
export INFOPATH
```

### For 64bit OS

```
edit ~/.bashrc file and add following lines
PATH=/usr/local/texlive/2011/bin/x86_64-linux:$PATH;
export PATH
MANPATH=/usr/local/texlive/2011/texmf/doc/man:$MANPATH;
export MANPATH
```

```
INFOPATH=/usr/local/texlive/2011/texmf/doc/info:$INFOPATH;  
export INFOPATH
```

**Fedora/RedHat/CentOS:**

```
sudo yum install texlive  
sudo yum install psutils
```

**SUSE:**

```
sudo zypper install texlive
```

**Debian/Ubuntu:**

```
sudo apt-get install texlive texlive-latex-extra  
sudo apt-get install psutils
```



# Appendix B

## Installing the CUED class file

$\text{\LaTeX}$ .cls files can be accessed system-wide when they are placed in the  $\langle\text{texmf}\rangle/\text{tex}/\text{latex}$  directory, where  $\langle\text{texmf}\rangle$  is the root directory of the user's  $\text{\TeX}$  installation. On systems that have a local  $\text{texmf}$  tree ( $\langle\text{texmflocal}\rangle$ ), which may be named “ $\text{texmf-local}$ ” or “ $\text{localtexmf}$ ”, it may be advisable to install packages in  $\langle\text{texmflocal}\rangle$ , rather than  $\langle\text{texmf}\rangle$  as the contents of the former, unlike that of the latter, are preserved after the  $\text{\LaTeX}$  system is reinstalled and/or upgraded.

It is recommended that the user create a subdirectory  $\langle\text{texmf}\rangle/\text{tex}/\text{latex}/\text{CUED}$  for all CUED related  $\text{\LaTeX}$  class and package files. On some  $\text{\LaTeX}$  systems, the directory look-up tables will need to be refreshed after making additions or deletions to the system files. For  $\text{\TeX}$ Live systems this is accomplished via executing “ $\text{texhash}$ ” as root.  $\text{MikTeX}$  users can run “ $\text{initexmf -u}$ ” to accomplish the same thing.

Users not willing or able to install the files system-wide can install them in their personal directories, but will then have to provide the path (full or relative) in addition to the filename when referring to them in  $\text{\LaTeX}$ .

