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Procrastination and Problematic Internet Use

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Problematic Internet use is the degree of comfort of a person in using *Internet* than living his life in the real world. The purpose of this study was to test Temporal Motivation Theory (TMT) by correlating problematic *Internet* use and procrastination. Subjects were psychiology students (*N*=131) who took Measurement Instrument Construction (MIC) course. Data were obtained by using the Pure Procrastination Scale (PPS), Online Cognition Scale (OCS), and Steel Procrastination Scale (SPS). Results revealed a positive correlation between procrastination and problematic *Internet* use (r = .370, p < .05). The main variables in the correlation originated from the distraction aspect. Results showed that the correlation between procrastination and problematic *Internet* use was not mediated by expectancy, value, and sensitivity to delay.

Keyword: procrastination, Internet, problematic, temporal motivation theory

Penggunaan Internet bermasalah merupakan tingkat kenyamanan seseorang dalam menggunakan Internet dibandingkan dengan kehidupannya di dunia nyata. Tujuan studi ini adalah untuk menguji *Temporal Motivation Theory* (TMT) dengan menghubungkan penggunaan Internet bermasalah dan prokrastinasi. Subjek penelitian adalah mahasiswa psikologi (*N*=31) yang mengambil mata kuliah PAU (Penyusunan Alat Ukur) pada semester genap tahun ajaran 2011/2012. Data diperoleh dengan menggunakan skala *Pure Procrastination Scale* (PPS), *Online Cognition Scale* (OCS), dan *Steel Procrastination Scale* (SPS). Pada studi ini ditemukan adanya korelasi positif antara prokrastinasi dan penggunaan *Internet* bermasalah (r = .370, p < .05). Variabel utama dalam korelasi ini berasal dari aspek distraksi. Hasil menunjukkan bahwa hubungan antara prokrastinasi dan penggunaan *Internet* bermasalah bukan dijembatani oleh aspek *expectancy*, *value*, dan *sensitivity to delay*.

Kata kunci: prokrastinasi, *Internet*, bermasalah, *temporal motivation theory*

Procrastination is irrational delay (unimportant or irrelevant), in which an individual delays even though it can cause worse conditions (Steel, 2010). Procrastination was reported since 800 B.C, in almost every culture (Gröpel & Steel, 2008). Procrastination happens generally in 95% of the population, and chronically 15%-20% in adults, and around 33%-50% in university students (Steel, as cited in Steel & König, 2006). In university students, an irrational tendency to delay the starting and finishing of an academic task is called an academic procrastination (Senécal, Julien, & Guay, 2003).

Rothblum, Solomon, and Murakami (1986) found that 154 of 379 (40.6%) subjects, which were 117 of 261 (44.8%) females and 37 of 117 (31.6%) males had high procrastination scores, based on the criteria of 'almost always delaying' or 'always delaying' when working on tests and 'almost always experiencing' or 'always experiencing'anxiety during delaying. Several others (*N* = 224, 114 (64.3%) females and 80 (35.7%) males) had low procrastination scores.

In 1984 Solomon and Rothblum conducted a research related to the frequency of procrastination in various academic tasks and problems caused by procrastination of university students. A similar research was conducted by Onwuegbuzie in 2004 on 135 postgraduate university students of a university in the United States of America.

Results of Solomon and Rothblum's (1984) and Onwuegbuzie's (2004) researches showed that university students often procrastinated on various academic tasks. Most university students procrastinated in report writing academic task (46.0% & 41.7%) and the weekly reading academic task (30.1% & 60.0%). On the other hand, a small percentage of the university students procrastinated in administration task (10.6% & 17.3%) and general school-related tasks (10.2% & 16.5%).

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The previous researches' results, Solomon and Rothblum (1984) and Onwuegbuzie (2004), also showed that university students often experienced problems caused by procrastination in various academic tasks. Most university students experienced problems caused by procrastination in the weekly reading tasks (41.5%) and in academic meetings (30.1%). On the other hand, a small percentage of them experienced problems caused by procrastination in general school-related tasks (8.3%).

Procrastination can cause problems and negative effects in university students. By procrastinating, a lot of time was wasted and tasks became neglected, and even if the tasks were completed on time, the results are not maxed (Rizvi, as cited in Anggraeni & Windyarini, 2008). Besides, procrastination can also cause an individual to lose future chances and opportunities.

There are several variables correlating with university student procrastination, one of it is problematic Internet use ($r = .67$, $p < .01$) (Thatcher, Wretschko, & Fridjohn, 2008). In 2010, Lawless also found similar results, that procrastination correlated positively with Internet use ($r = .355$, $p < .002$) in 63 university students (29 males = 46%; 36 females = 54%) of Xavier University. According to Lawless, university students who were spending lots of time with the Internet had a higher chance to delay.

Specifically, David, Flett, and Besser (2002) found that procrastination also correlated positively with the aspects of problematic Internet use, which were loneliness/depression ($r = .25$, $p < .001$), diminished impulse control ($r = .34$, $p < .001$), social comfort ($r = .23$, $p < .001$), and distraction ($r = .50$, $p < .001$). Loneliness/depression refers to an individual's tendency to use the Internet to cope with the feeling of worthlessness and loneliness by obtaining social comfort through the Internet. Diminished impulse control refers to an individual's tendency to use the Internet obsessively, unable to reduce Internet use even though the individual wants to. Social comfort refers to an individual's tendency to use the Internet to anticipate the threats of social rejection, as an attempt to protect the individual's self. Distraction refers to an individual's tendency to use the Internet to avoid and distract himself from stress, tasks, and various matters.

From the results of Davis, Flett, and Besser's research, it was found that the distraction aspect ($r = .50$, $p < .001$) had the highest correlation coefficient score from the four aspects of problematic Internet use. This showed that generally an individual use the Internet to avoid and delay working on unwanted tasks.

The use of the Internet in the community and in universities has increased dramatically in the past several years. Most university students in Taiwan had the experience of using the Internet for two years or more (Chou, 2001). University students spent around 4-5 hours daily online during active university times and increased into 5-10 hours daily online during weekends or university holidays. Ten university students indicated that they used the Internet the whole day on their work place, dormitory, and laboratory, never logging off from the Internet. As many as 25 (30.1%) university students stated that they experienced the feelings of loss, melancholy, anxiety, and a strong urge to log on into the Internet (Chou).

Healthy Internet use refers to the use of Internet in a normal amount of time without being accompanied by cognitive and behavior discomfort (Davis, 2001). Healthy Internet use can differentiate Internet communication with real life communication. Healthy Internet users use the Internet as a useful tool, not simply as a source of identity. There is no specific time limit or behavior standard, problematic Internet use can be observed from the length of an individual's use of Internet, both adaptively or maladaptively.

University students generally assess Internet positively as one of the components in their university life (Chou, 2001). The positive effects could be self-identification, closer relationship with friends and surroundings, and various other effects. Chou found that 38 (45.8%) university students stated that they had better relationship with old friends because of the communication network provided by the Internet. As many as 45 (54.2%) university students stated that they found new friends in the Internet. Furthermore, several other university students stated that they have met their Internet friends offline.

Other than having positive effects in social and academic aspects, Internet use can also cause academic problems for university students. According to Young (1996), despite the benefits of Internet and making it an ideal research instrument, university students also experience significant academic problems because of surfing irrelevant web sites, being involved in chat room gossips, and playing interactive games. Internet misuse can cause university students experience problems in completing their tasks, studying for tests, or sleeping properly. Often, university students that cannot control their Internet use receive bad grades, academic probation, or even disqualification.

In 2004, DiNicola further researched the correlation between Internet use and procrastination. DiNicola requested Midwestern University students to report how their Internet use affects various matters, such as: relationship statuses, academic success, sleep depri-

vation, class absence, or class loss. From the university students, 1.2% of the students reported that their Internet use had negative effects on academic success, 14% reported negative effects on class absence and loss, and 20.7% reported negative effects in the ability to get enough sleep.

Furthermore, Internet overuse in the university student population also correlated with low academic performance (Griffiths; Kubey, Lavin, & Barrows; Leon & Rotunda, as cited in DiNicola, 2004), low self-esteem (Greenberg, Lewis & Dodd, as cited in DiNicola, 2004), depression (Young & Rogers, as cited in DiNicola, 2004), and loneliness (Morahan-Martin & Schumacher, as cited in DiNicola, 2004). Therefore, the correlation between procrastination and Internet use was very important to be further investigated.

Different from previous researches, this study used Temporal Motivation Theory (TMT) to explain the correlation between procrastination and Internet use in more detail. TMT is an integrated motivation model that is able to explain an individual's self-regulation through several theoretical perspectives, which are: economy, personality, need theory, and goal-setting (Steel & König, 2006).

TMT has four main variables, which are: expectancy, value, sensitivity to delay, and delay. Expectancy is best represented by self-efficacy (Bandura, as cited in Steel, 2007). Self-efficacy is the belief that an individual has the ability to complete a series of tasks. Value refers to an individual's tendency to consider a boring and taxing task as having a low value. Sensitivity to delay refers to an individual's tendency to be easily distracted or bothered by temporary desires.

TMT predicts that an individual will prioritize an action that has the highest utility level (Steel & König, 2006). Writing a report is often an action that is intrinsicly not interesting for a university student. Reward from writing a report is relatively obtained after a long period of time, often not obtained until the end of the semester. This matter was further worsened by other social activities and temptations, being instrinsicly more interesting. On the other hand, hyperbolic discounting shows that an individual tend to enjoy unimpor-tant activities that were more interesting. As an example, easily accessible Internet and e-mail were one of the facilitators affecting work procrastination (Brackin, Ferguson, Skelly, & Chambliss; Lavoie & Pychyl, as cited in Steel & König, 2006).

Due to the high number and effects of procrastination and the high number and negative effects of problematic Internet use in university students, the author's hypotheses were: a positive correlation between procrastination and problematic Internet use; the distraction aspect was the main variable in the correlation between procrastination and problematic Internet use; and the expectancy, value, and sensitivity to delay aspects could mediate the correlation between procrastination and problematic Internet use.

Method

This study was conducted in the Psychology Faculty of Universitas Surabaya by using the students as the general population. The study subjects consisted of 131 psychology students from 2009 and 2010 generations that were taking the MIC course on the even semester of 2011/2012. The author chosed the subjects from the psychology students population because they often delay the completion of a report irrasionally, only completing it when they were nearing the deadline. This often caused high levels of stress and performance reduction (Steel & König, 2006).

Procrastination was measured using the PPS scale and problematic Internet use was measured using the OCS scale. The author also used another scale, which was the Steel Procrastination Scale (SPS), designed based on the TMT construct. The SPS scale was used to explain the correlation between PPS and OCS, using TMT as the base theory.

Steel constructed the PPS scale in 2010 with the goal of measuring irrational delaying levels that individuals disfunctionally delay to their own standards (Andreou; Simpson & Pychyl; Steel, cited in Steel, 2010). PPS has a good alpha cronbach coefficient (α = .92 > .9). Not only reliable, the PPS scale is also a valid scale. Steel (2010) conducted a convergen validity test by correlating the PPS scale with the DPQ scale (r = .82 > .2), AIP scale (r = .68 > .2), and GPS scale (r = .65 > .2). Each statement on the PPS scale requested the subject to respond by choosing one of the five answer options constructed from the Likert scale, which were ranging from "Strongly Disagree" to "Strongly Agree" (see Table 1).

Meanwhile, Davis, Flett, & Besser (2002) constructed the OCS scale to measure problematic Internet use. The OCS scale in total has a good alpha cronbach coefficient (α = .94 > .9) and the four aspects are reliable, which were the *loneliness/depression* aspect (α = .77), *diminished impulse control* aspect (α = .84), *social comfort* aspect (α = .87), and *distraction* aspect (α = .81). Results of the validity test showed that the OCS scale had good item-total correlation score on the four aspects, which were the *loneliness/depression*

aspect (.49 - .81), *diminished impulse control* aspect (.50 - .76), *social comfort* aspect (.47 - .77), and *distraction* aspect (.55 - .80). Every statement in the OCS scale request the subject to respond by choosing one of the seven answer options constructed using the *thurstone* scale, ranging from "Strongly Disagree" to "Strongly Agree" (see Table 2).

The author also used the secondary data of the SPS scale because it had a good alpha cronbach coefficient on the three aspects, which were the *expectancy* aspect (α = .773 > .7), *value* aspect (α = .740 > .7), and *sensitivity to delay* aspect (α = .764 > .7) (Endy & Siaputra, 2012). Other than being reliable, the SPS scale was also a valid scale. The SPS scale had acceptable loading factor scores on the three aspects, which were the *expectancy* aspect (.438 - .680), *value* aspect (.227 - .751), and *sensitivity to delay* aspect (.189 - .747). Every statement in the SPS scale requested the subject to respond by choosing one of the five answer options constructed using the Likert scale, ranging from "Strongly Disagree" to "Strongly Agree" (see Table 3).

A reliability test was also conducted in this study on the PPS, OCS and SPS scales. Table 4 shows that the PPS, OCS, and SPS were reliable scales revealed through the scores of: PPS scale (.885 $\geq$ .7), OCS scale (α = .956 $\geq$ .7), and the three aspects of the SPS scale, which were *sensitivity to delay* (α = .867 $\geq$ .7), *expectancy* (α = .788 $\geq$ .7) and *value* (α = .708 $\geq$ .7). This meant that none of the items or aspects were discarded.

Data analysis in this study was conducted using

Table 1
PPS Scale Blueprint

Item Distribution	Item Number	Item Example
Favorable Item	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	Item 9: I feel that I am running out of time. Item 10: I am unable to complete many tasks on time.
Total	12	

Table 2
OCS Scale Blueprint

Aspect	Item Number		F	Item Example
	Favorable	*Unfavorable*		
Loneliness/Depression	2, 22, 23, 24, 25, 35		6	Item 22: My loneliness is reduced when I am online. Item 25: I feel helpless when I have no access to the Internet.
Diminished Impulse Control	4, 5, 10, 11, 15, 17, 21, 34, 36	12	10	Item 21: I cannot stop thinking about the Internet. Item 34: Even though I what to at times, I cannot reduce my Internet usage.
Social Comfort	1, 3, 6, 7, 8, 9, 13, 14, 16, 18, 19, 26, 31		13	Item 9: I am more respected online than in real life. Item 26: I state or do things in the Internet that I cannot do in real life.
Distraction	20, 27, 28, 29, 30, 32, 33		7	Item 30: I occasionally use the Internet to delay. Item 32: I often use the Internet to avoid uninteresting matters. Item 33: Using the Internet is a good way to forget matters that are supposed to be completed but are not desireable
Total			36	

SPSS 16.0 for Windows. The hypothesis test was conducted using the one-tailed correlation test and the correlation test was conducted using the product moment Pearson correlation technique. A hypothesis was accepted if the *r* score > .2 or *r* > -.2. The results of the product moment Pearson correlation test was followed by the partial correlation test.

Results and Discussion

The author collected the data with nine other researchers once between June 4, 2012 and June 9, 2012. Data collection was conducted together because the study subjects were similar, making it more efficient in collecting the data. Besides the efficiency, several

Table 3
SPS Scale Blueprint

Aspect	Item Number		F	Item Example
	Favorable	*Unfavorable*		
Expectancy	1, 4, 7, 10, 13, 16, 19, 22	-	8	Item 10: I am confident that my hard work will produce results. Item 19: I can overcome problems with enough effort.
Value		2, 5, 8, 11, 14, 17, 20, 23	8	Item 11: Work makes me bored. Item 20: I feel that my work is uninteresting.
Sensitivity to Delay	3, 6, 9, 12, 15, 18, 21, 24	-	8	Item 15: When there is something more interesting, I am easily distracted. Item 24: I choose to have smaller but instant satisfaction than bigger but delayed satisfaction.
Total	16	8	24	

Table 4
Reliability Test Results

No.	Scale	*Corrected Item-Total Correlation*	Alpha Cronbach (*α*)
1	PPS	.314 - .759	.885
2	OCS	.300 – .766	.956
	a. Loneliness/ Depression	.240 – .705	.796
	b. Diminished Impulse Control	.389 – .753	.877
	c. Social Comfort	.327 – .775	.895
	d. Distraction	.419 – .688	.826
3	SPS		
	a. Expectancy	.342 – .617	.788
	b. Value	.071 – .548	.708
	c. Sensitivity to Delay	.414 – .756	.867

Table 5
Procrastination Score Frequency Distribution

No.	Academic Procrastination Score	Category	F	Percentage (%)
1	≤ 18.20	Very Low	2	1.5
2	18.21 – 26.84	Low	16	12.2
3	26.85 – 35.49	Average Low	50	38.2
4	35.50 – 44.13	Average High	42	32.1
5	44.14 – 52.78	High	19	14.5
6	≥ 52.79	Very High	2	1.5
		Total	131	100

Note. Item Total: 12; Ideal *Mean*: 36; *Mean*: 35.489; *Item Average Mean*: 2.957; *Median*: 34; SD: 8,646; *Min Value*: 16; *Max Value*: 55

Table 6
Problematic Internet Use Frequency Distribution

No.	Problematic Internet Use Score	Category	F	Percentage (%)
1	≤ 46.15	Very Low	2	1.5
2	46.16 – 81.61	Low	18	13.7
3	81.62 – 117.08	Average Low	50	38.2
4	117.09 – 152.54	Average High	48	34.8
5	152.55 – 188	High	14	10.7
6	≥ 188.01	Very High	4	3.1
	Total		131	100

Note. Item Total: 36; Ideal *Mean*: 144; *Mean*: 117.076; Item Average *Mean*: 3.252; *Median*: 114; SD: 35.464; *Min Value*: 41; *Max Value*: 217

Table 7
Procrastination and Problematic Internet Use Correlation Test

OCS \ PPS	Total (*r*)
Loneliness/Depression	.316*
Diminished Impulse Control	.338*
Social Comfort	.300*
Distraction	.416*
Total (r)	.370*

Note. Significant on $p < .05$

other researchers used the same procrastination and flow inventory. Data collection was conducted by filling in online inventories through Google Docs.

Research Subject Description

In this study, most of the subjects were females (108 subjects = 82.4%) and the rest were males (23 subjects = 17.6%). Most of the subjects were in the 18-22 years old age range (129 subjects = 98.5%) and the rest were in the > 22 years old age range (2 subjects = 1.5%).

Research Data Description

Table 5 shows that most subject had the procrastination score in the category of average low (50 subjects = 38.2%). Several other subjects had the procrastination score of very low category and very high category, each category having 2 subjects (1.5%).

Table 6 shows that most subjects had the problematic Internet use score on the category of average low (50 subjects = 38.2%). Two subjects had the problematic Internet use on the very low category (1.5%).

Hypothesis Test

Correlation test results of the PPS and OCS scales showed that the hypothesis was accepted (r = .370) in Table 7. This meant that there was a positive correlation between procrastination and problematic Internet use. Positive correlation meant that procrastination works in accordance with problematic Internet use. The higher the procrastination level, the higher the level of problematic Internet use, and vice versa.

The correlation between procrastination and problematic Internet use could be explained from the aspect of loneliness/depression in (see Figure 1). The positive correlation between the aspect of loneliness/depression and value showed that when an individual considered a task to be uninteresting and taxing, the individual's mind tend to be distracted into matters that were more interesting. For example: using the Internet to achieve social comfort that was easily to achieve compared to social comfort in real life. Meanwhile, negative correlation between the aspect of loneliness/despression and expectancy showed that an individual with low self-efficacy tend to experience irrational beliefs, doubting their own ability to complete a task well. The individual with such beliefs tend to use the Internet to achieve social comfort.

The correlation between procrastination and problematic Internet use could be explained from the diminished impulse control aspect (see Figure 2). The correlation between the diminished impulse control and sensitivity to delay aspect showed that an individual with high impulsiveness level or easily distracted, tend to be unable to focus his mind and had an obsessive cognitive thought. For example: being unable to reduce Internet use despite wanting to.

The correlation between procrastination and problematic Internet use could be explained from the social comfort aspect shown in Figure 3. The correlation between the aspect of social comfort and value showed that an individual that felt that a task or social environment to be uninteresting or taxing tend to often use the Internet, considering it to be more interesting and satisfying because of the ability to provide social comfort.

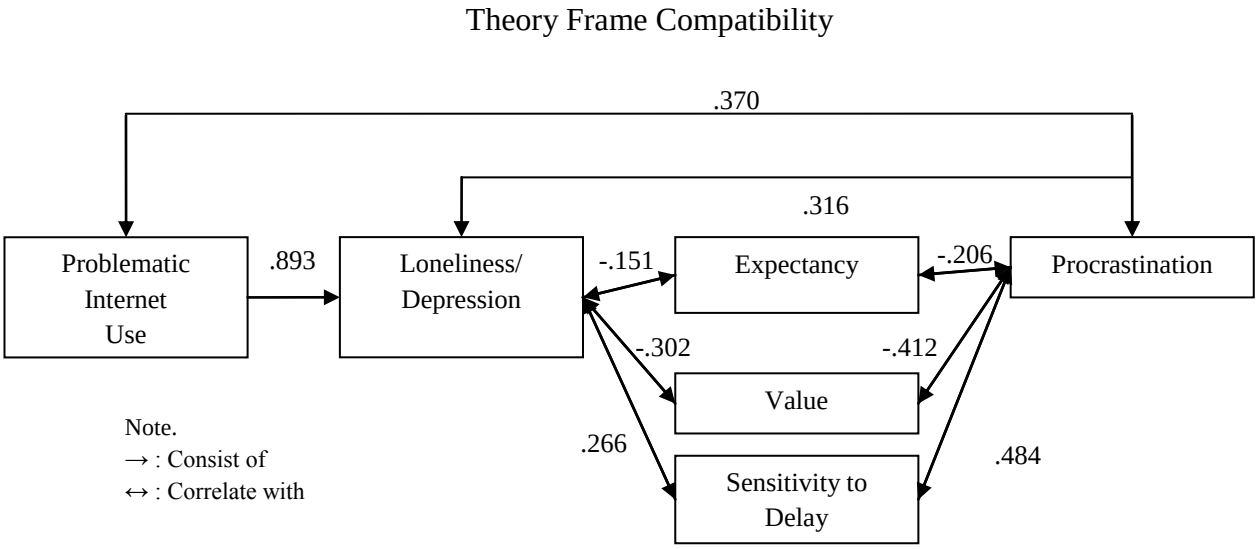

Figure 1. The correlation between procrastination and problematic Internet use viewed from the loneliness/depression aspect.

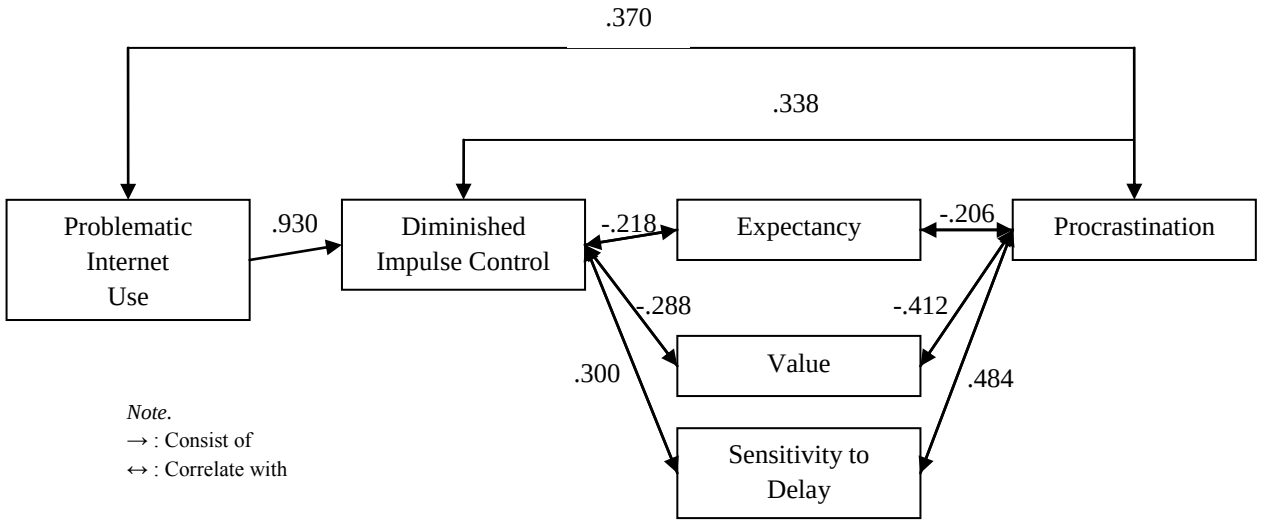

Figure 2. The correlation between procrastination and problematic Internet use viewed from the diminished impulse control aspect.

The Internet was used to explore social communication without the threat of rejection, making an individual feel more respected online than in real life.

Meanwhile, the correlation between the aspect of social comfort and sensitivity to delay showed that an individual that was easily bothered and distracted by temporary urges tend to feel that online relationships could be more satisfying than offline relationships, using the Internet to explore social communication without the threat of rejection.

The correlation between procrastination and the social comfort aspect showed that an individual with low self-efficacy experienced irrational beliefs, doubting his ability to complete a task. Low self-efficacy tend to result in rejection sensitivity, causing disposition, which is the anticipation of rejection as an effort to protect one's self. An individual tend to use the Internet to explore social communication without the threat of rejection.

The correlation between procrastination and problematic Internet use could be explained from the aspect

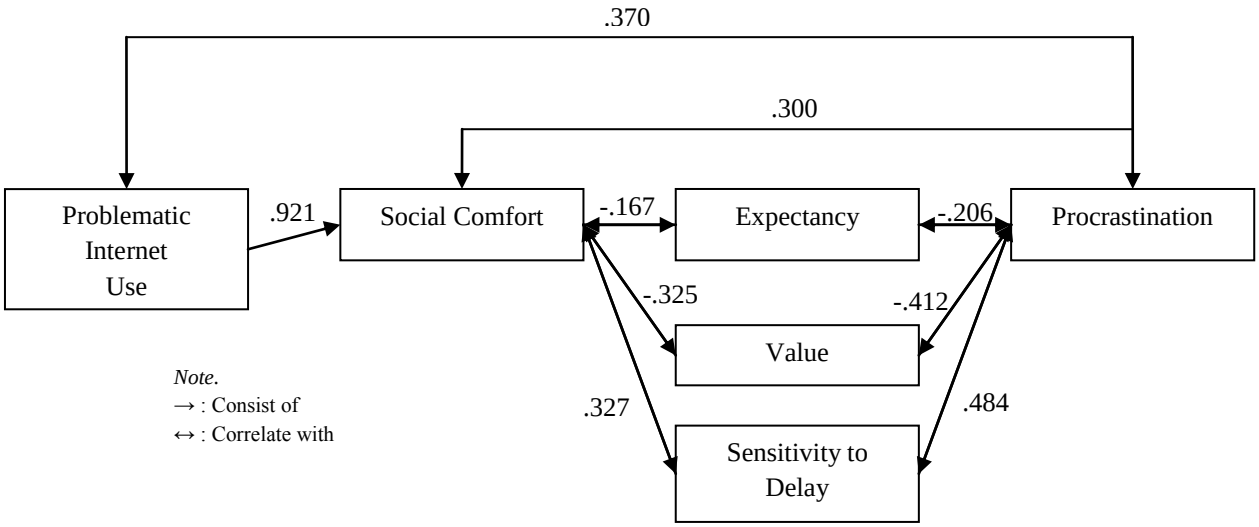

Figure 3. The correlation between procrastination and problematic Internet use viewed from the social comfort aspect.

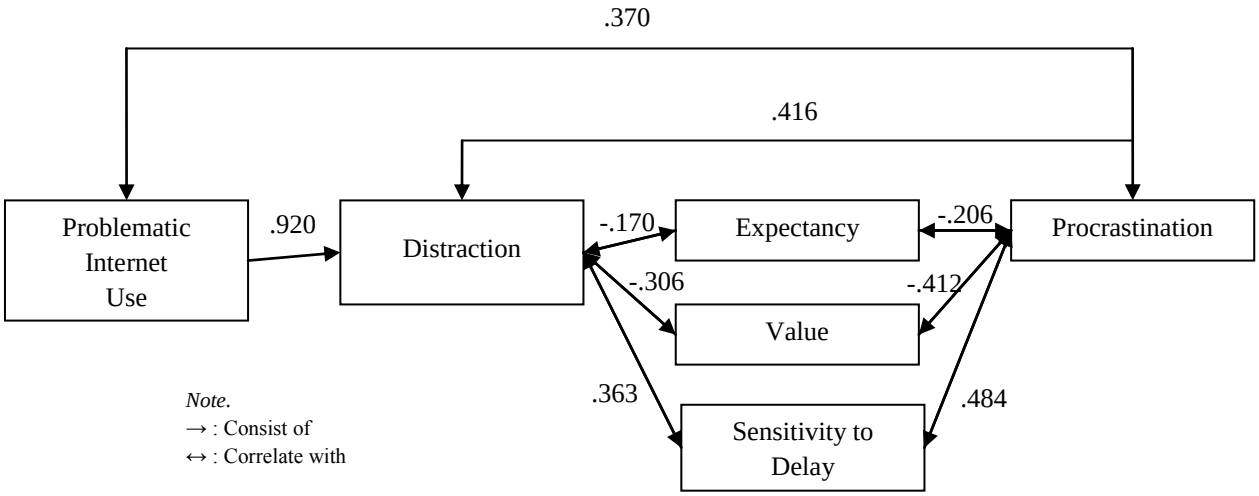

Figure 4. The correlation between procrastination and problematic Internet use viewed from the distraction aspect.

of distraction, shown in Figure 4. The correlation between the aspect of distraction, value, and sensitivity to delay showed that an individual with high impulsiveness tend to be easily troubled and distracted, trying to avoid uncomfortable stimulations by using the Internet.

The Correlation Between Procrastination and Problematic Internet Use

Procrastination had a positive correlation with the four aspects of problematic Internet use and every correlation coefficient score was close to the .2 criterion. However, there was one aspect of problematic Internet use that had a higher correlation coefficient score with procrastination compared to the other aspects, which was the aspect of distraction (r = .416, p < .05). This indicated that the aspect of distraction was the main aspect in the correlation between procrastination and problematic Internet use.

The assumption regarding the aspect of distraction being the main variable in the correlation between procrastination and problematic Internet use was supported by the partial correlation and Fisher test results. Partial correlation test was conducted by corre-

lating procrastination and problematic Internet use by controlling the aspect of distraction. The results of the partial correlation test showed that if the aspect of distraction was controlled, the correlation score decreased, showing no correlation between procrastination and problematic Internet use (r = -.036, p > .05). The partial correlation test were continued by using the Fisher test, showing that there were differences between the null-correlation test and the partial correlation test, by controlling the aspect of distraction (z = 4.830 > 1.96).

TMT was assumed to be able to explain the correlation between procrastination and problematic Internet use through the three aspects. Howerer, the assumption that the aspects of expectancy, value, and sensitivity to delay could explain the correlation between procrastination and the four aspects of problematic Internet use was rejected and not supported by the partial correlation test result. Partial correlation testing was conducted by correlating procrastination and each of the four aspects of problematic Internet use, by controlling the aspects of expectancy, value, and sensitivity to delay. Results showed that if the aspects of expectancy, value, and sensitivity to delay were controlled, the correlation score decreased, but there was still an existing correlation between procrastination and each of the four aspects of problematic Internet use.

This result meant that the correlation between procrastination and each of the four aspects of problematic Internet use was mediated by a different variable, not the aspects of expectancy, value, and sensitivity to delay. An individual that conducted irrational delay, felt worthless and unable to reduce Internet use despite the feeling of wanting to reduce it, used the Internet to avoid and distract himself from the conditions of stress, tasks, and other matters; not caused by the inconfidence in being able to finish a series of task, uninteresting or boring tasks, and the tendency to be easily troubled by temporary urges.

Conclusion

This study found positive correlation between procrastination and problematic Internet use, with the aspect of distraction being the main mediating variable in the correlation. The other aspects of the OCS scale were not considered to be significant enough as mediating aspects, this was revealed when each of the three aspects was controlled during further testing. Based on the findings, two of the three research hypotheses were accepted. While the study accepted that the aspect of distraction was the main variable in the correlation between procrastination and problematic Internet use, the detailed nature of the distraction aspect itself was not inquired. Therefore, there is a need to inquire further regarding this aspect by using an open survey related to frequency, duration, and Internet usage history, to find the specific consistency and the nature of the behavior in problematic Internet use. A more detailed knowledge regarding the aspect of distraction is considered to be valuable for future researches and interventions. There is also the need to collect cross-loading items between procrastination and problematic Internet use in order to find other variables that possibly mediate the correlation.

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