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<tr>
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# Table of Contents

<table>
<thead>
<tr>
<th>Acknowledgements</th>
<th>i</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of Contents</td>
<td>ii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>iii</td>
</tr>
<tr>
<td>List of Appendices</td>
<td>iv</td>
</tr>
<tr>
<td>References</td>
<td>31</td>
</tr>
<tr>
<td>Tables</td>
<td>40</td>
</tr>
<tr>
<td>Appendices</td>
<td>45</td>
</tr>
<tr>
<td>Summary</td>
<td>52</td>
</tr>
</tbody>
</table>
List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1. Means and Standard Deviation of Study Variables</td>
<td>40</td>
</tr>
<tr>
<td>2. Hypothesis 1: Moderation Model</td>
<td>41</td>
</tr>
<tr>
<td>3. Hypothesis 2: Moderation Model</td>
<td>42</td>
</tr>
<tr>
<td>4. Hypothesis 3: Mediation Model</td>
<td>43</td>
</tr>
<tr>
<td>5. Hypothesis 4: Mediation Model</td>
<td>44</td>
</tr>
</tbody>
</table>
List of Appendices

Chapter V    Page

A. Demographic Questionnaire.................................................................45
B. Problematic Internet Use Survey (GPIUS-2)..........................................47
C. Passion Scale.........................................................................................48
D. Flow Measure.........................................................................................49
E. IRB Approval Letter................................................................................50
E. Debriefing Statement..............................................................................51
Abstract

Problematic internet use (PIU) is increasingly becoming a problem in the United States, and a handful of studies have found a positive relationship between PIU and flow. These findings are striking as flow is generally considered to be an optimal psychological state. In internet based studies flow is a concept that has been poorly defined and inconsistently measured. Furthermore, research has suggested that other factors, such as passion, may influence the relationship between flow and PIU. The present study examined the possible moderating effect that obsessive passion (OP) has on the relationship between particular flow elements (time distortion and telepresence) and PIU. Past research has suggested that time distortion and telepresence are more related to PIU than other flow elements. Measures assessing these constructs were given to 131 Xavier University students and were examined using moderated multiple regression analyses. These analyses were non-significant, suggesting that OP does not moderate the relationship between time distortion/telepresence and PIU. However, a post hoc analysis did show that OP does mediate the relationship between time distortion/telepresence and PIU. These findings support a model where the relationship between these flow elements and PIU is explained by OP. These findings also help to clarify the discrepant findings on the relationship between flow and PIU.
The Relationships among Flow, Passion, and Problematic Internet Use

Over the past two decades, use of the internet has grown exponentially. In 1989 there were only 500,000 internet users worldwide (Morahan-Martin, 2005). This is striking when compared to recent US Census Data that suggests 88.1% of Americans between the ages of 25-34 use the internet (File, 2013). One consequence of this trend is that more people each year are being identified as developing problematic behaviors related to internet use (Christakis, 2011). It has been suggested in recent years that flow may play a role in problematic internet use (PIU), especially with regard to internet gaming (Chou & Ting, 2003). Flow is a concept that originally came from the positive psychology tradition. It is generally characterized as an optimal psychological state, whereby the person experiencing it is fully immersed in the task at hand, and the activity is rewarding in and of itself (Csikszentmihalyi, 1990). It has been proposed that the intrinsic enjoyment that results from the flow experience can cause some people to repeatedly engage in internet related activities to an unhealthy extent (Chou & Ting, 2003; Raul, Peng, & Yang, 2007).

Despite its benign beginnings, a number of studies have found a positive relationship between flow and PIU (Chou & Ting, 2003; Kim & Davis, 2009; Park & Hwang, 2009; Qin, Rau, & Zhong, 2007; Thatcher, Wretschko, & Fridjhon, 2008). The association is particularly strong with regard to the flow constructs of time distortion (losing track of time while engaged in an activity) and telepresence (feeling of being present in a mediated environment such as the internet; Bridges & Florsheim, 2008). Not all researchers have found a positive relationship
between certain flow elements and PIU (Wan & Choi, 2006), but it has happened too often to be easily dismissed. Traditionally, researchers have not been consistent in how they have measured flow (Wang, Liu, & Khoo, 2009) or PIU (Shoenfeld, 2012), which has further muddled the pattern of results.

One variable that may help explain flow’s relationship to PIU is passion. According to Vallerand et al. (2003), passion is defined as “a strong inclination toward an activity that people like, that they find important, and which they invest time and energy” (p. 757). There are two different kinds of passion, harmonious and obsessive (Vallerand et al., 2003). The primary difference between these two forms of passion is the extent to which the activity in question is in conflict with other activities in one’s life and how the activity is internalized in one’s sense of self. The present study attempted to build upon previous research and examined the possible effect that obsessive passion has on the relationship between certain flow constructs (telepresence and time distortion) and PIU.

**Problematic Internet Use**

Until recently, there have been many different conceptualizations of PIU and this has made it difficult to consistently measure the phenomenon. A recent review reported that there have been 15 different measures developed to measure PIU; however, many appear to be redundant (Shoenfeld, 2012). According to Morahan-Martin (2008) some researchers studying PIU view it as a disorder or disease (Young, 1998), while others view it as problem with impulse control (Shapira et al., 2003). Still others view it as a deficiency in self-regulation that falls along a continuum (Caplan, 2002; LaRose, Lin, & Easton, 2003). One area in which all of the different camps have consistently agreed is that PIU should be defined based on the negative
consequences it has for the person’s life (Caplan, 2002; LaRose, Lin, & Easton, 2003; Shapira et al., 2003; Young, 1998). Moreover, most researchers in this field have generally agreed that some of the key attributes of PIU are preoccupation with using the internet, using the internet as an escape from life stressors or to regulate mood, and feeling unable to control one’s use of the internet (Morahan-Martin, 2008).

In the current study, PIU was measured using Caplan’s (2002, 2010) Generalized Problematic Internet Use Survey 2 (GPIUS-2). This measure was chosen due to it being updated on numerous occasions to account for previous research findings and it has been shown to be a reliable and valid measure of PIU (Yu, 2011). Caplan’s (2002) initial theory of PIU was heavily influenced by Davis’ (2001) cognitive behavioral model, which conceptualized PIU (Davis used the term pathological internet use) as a “distinct pattern of internet related cognitions and behaviors that result in negative outcomes” (p. 556). In this theory, maladaptive cognitions and behaviors associated with PIU are seen as a consequence of, rather than a cause of, other psychopathology. Therefore, people who develop the thoughts and behaviors characteristic of PIU may be persons who generally struggle with social interaction and/or following through with obligations due to anxiety and depression.

For persons at risk for PIU, online social interaction is often perceived to be less risky than face to face interaction. Therefore, these persons may be more capable of communicating effectively and getting tasks done online, because the internet doesn’t require them to be in the presence of other people. According to Caplan (2002), this imbalance in outcomes causes these people to think much more highly of themselves online than offline. When these people are then confronted with life stressors, instead of dealing with them directly, they turn to the internet to
escape their negative thoughts and emotions. This behavior ultimately results in negative consequences for the person in their neglected life domains. Over time, the cognitions and behaviors associated with the internet become more pronounced as the person experiences more and more negative feedback from the outside world. This interaction ultimately results in the “vicious cycle” that characterizes Caplan’s (2002) view of PIU.

The cognitive behavioral theory of PIU was then further advanced by Caplan (2003), who suggested that certain individuals are predisposed to having difficulty in social interactions which results in loneliness and depression. These individuals develop a preference for online social interaction (POSI), which subsequently results in negative outcomes associated with internet use. Caplan (2005) later examined PIU’s relationship to self-presentation and social skills. He found that people who lack self-presentation skills (ability to present oneself to others in a positive manner during FTF interactions) are more likely to prefer online social interactions. Moreover, POSI was found to be predictive of both compulsive internet use and negative outcomes related to internet use.

Based on these findings and the findings of other PIU researchers, Caplan (2010) then revised his cognitive behavioral model of PIU and created the GPIUS-2. He identified a few key constructs related to PIU, such as POSI (Caplan, 2003), mood regulation (Caplan, 2002), and deficient self-regulation (LaRose Lin, & Eastin, 2003). He also eliminated excessive internet use from his model, since research has generally not found it to be related to PIU behaviors (Widyanto & McMurran, 2004; Young 1998). Caplan (2010) then tested this conceptual model with the GPIUS-2. Based on research done since the development of the GPIUS, there were a number of changes to the scale. First, the social control and social benefits factors were
operationalized into the single factor POSI. Deficient self-regulation was also introduced as a higher order factor that influences both compulsive internet use and cognitive preoccupation and the subscale excessive internet use was dropped from the measure. The measure was also shortened from 29 to 15 items, with each of the five subscales (POSI, mood regulation, cognitive preoccupation, compulsive internet use, and negative outcomes) consisting of three questions each.

**Passion and PIU**

Relatively recently, a dualistic model of passion was developed for activities (Vallerand et al., 2003). With harmonious passion (HP) the person engages in an activity for the inherent satisfaction that it brings. Persons who experience this form of passion will have a strong but controllable urge to engage in the activity. If restricted from engaging in the activity they experience relatively little distress and are able to fully engage in other activities.

With obsessive passion (OP) the activity serves a compensatory function for the person and becomes a substitute for self-worth. Due to the protective function that this activity has for the person, it becomes difficult for them to put it aside. Furthermore, if they are unable to engage in the activity they experience a great deal of distress that prevents them from fully focusing their attention on anything else. As a result, the person engages in the activity compulsively and rigidly, persisting in the activity in spite of any negative consequences that may result.

Research that has examined these two types of passion for internet related activities has generally supported the dualistic model. Seguin-Levesque et al. (2003) measured how passion for the internet influenced peoples’ level of self-determined motivation towards their romantic
relationship. They found OP towards the internet to be related to greater conflict, lower self-determination, and lower didactic adjustment within the relationship. In contrast, HP had the opposite relationship to these variables. The researchers also found that the number of hours participants spent using the internet did not mediate the relationship between OP and self-determination within the relationship. These findings led the authors to conclude that internet use does not lead to poor interpersonal outcomes. Instead, the type of passion one has for the internet activity is a determining factor in the quality of the participant’s relationships. This conclusion is consistent with the findings of prominent internet addiction (Young, 1998) and PIU researchers (Cohen, 2010; LaRose Lin, & Eastin, 2003).

Other online studies in passion provide further corroborative evidence of the dualistic model of passion. Wang and Yang (2006) found OP individuals to be more likely than HP individuals to be dependent on online shopping, and those with HP were more likely than low passion individuals to be dependent on online shopping. Wang and Yang (2008) later found persons high in OP and HP to spend more time online shopping and be more dependent on the activity than persons without passion for the activity. However, they also found people with high OP to be significantly more dependent on online shopping than those in the high HP group.

In online gaming studies, Wang and Chu (2007) found OP to be positively related to gaming addiction and HP unrelated to it. Wang, Khoo, Liu, & Divaharan (2008) found HP to be more associated with positive affect and more self-regulation of online gaming behavior, whereas OP was more related to external forms of regulation and more time spent playing the games. Lafreniere, Vallerand, Donahue, and Lavigne (2009) found both HP and OP were associated with positive affect while playing video games, but OP was also associated with
negative affect and problematic gaming behaviors. Przybylski, Weinstein, Ryan, and Rigby (2009) found HP to be positively related to basic needs satisfaction (presence of autonomy, relatedness, and competence), higher levels of post play energy, game enjoyment, mental health and life satisfaction. OP was related to post play tension, greater amounts of play, and was negatively related to basic needs satisfaction.

In conclusion, research has generally supported the dualistic model of passion first proposed by Vallerand et al. (2003). There appear to be significant differences between the outcomes of persons endorsing HP and OP for a wide range of internet activities. One exception to this general finding is in particular activities such as online shopping, which can be problematic if it is done often. In these cases, the data still shows OP to be more strongly related to negative outcomes than HP. With the exception of a couple studies (Wang & Yang, 2006; Wang & Yang, 2008) most researchers have treated both forms of passion as continuous variables and have used correlation and regression analyses to understand more about these constructs.

Flow

The concept of flow first originated from Mihaly Csikszentmihalyi (1975). Based on interviews of chess masters, basketball players, rock climbers, surgeons, composers, dancers etc., Csikszentmihalyi (1975) concluded, that, regardless of their chosen activity, his interviewees would describe a state where they became lost in their work or play to the point where nothing but the activity itself would matter. Paradoxically, once they had completed the activity while in this state, their interest for it dissipated for a period of time and they were able to focus their attention elsewhere. Through these interviews Csikszentmihalyi (1975) concluded that flow
consisted of six different elements: A merging of action and awareness; focused attention on the
task at hand; a loss of self-consciousness; a feeling that one is in control; clear feedback to a
person’s actions; and that the activity becomes autotelic in nature (intrinsically interesting).

These early findings on flow led to the development of the experience sampling method. This research strategy asks participants to periodically stop what they are doing and make notes of their experience while engaging in their chosen activity (Larson & Csikszentmihalyi, 1983). Data collected from this method expanded Csikszentmihalyi’s conception of flow into an integration of nine different constructs (Csikszentmihalyi, 1990). These include a perceived match between challenges and skills, a clear set of goals for the activity at hand, a merger of action and awareness, unambiguous feedback, concentration on the task, a sense of control, loss of self-consciousness, time transformation, and autotelic experience.

Flow appears to arise irrespective of the task nature (Csikszentmihalyi, 1990). It is considered to be a powerful intrinsic motivator, as the state itself is consistently rated as being deeply enjoyable even if the task requires a good deal of hard work. Flow is not considered to be a regular experience when engaging in the selected activity; rather each occurrence is something that occasionally happens to the person. Flow is also considered to be a necessary ingredient in a person’s ability to live a life worth living as it allows people to forget about their problems for a time and build mastery in their chosen activity. However, it has been emphasized by Csikszentmihalyi (1990) that flow experiences need not be associated with positive activities, as flow can occur while engaging in computer hacking, theft, and physical violence.

In contrast to the clear description and measurement of flow put forth by Csikszentmihalyi, online flow research has been hampered by a number of methodological
problems, with inconsistent measurement of the construct at the forefront (Novak and Hoffman, 2009). A review article by Finneran and Zhang (2005) elucidated this problem in their summary of 16 studies looking at flow in computer mediated environments (CME). They found significant divergence from Csikszentmihalyi’s (1990) theory of flow. Some CME researchers deleted many of his constructs from their models, while others created their own constructs, and most did both of these things. Novak, Hoffman, and Yung (2000) attempted to make sense of the work of early CME flow researchers by creating a model that included all 13 of the constructs that had been used in previous studies. However, even Novak, Hoffman, and Yung’s model excluded three dimensions that are a part of Csikszentmihalyi’s (1990) theory of flow: clear goals, merger of action and awareness, and loss of self-consciousness (Finneran & Zhang, 2005). It would appear at the present moment that there exist far too many conceptualizations of flow to determine a “gold standard” operational definition of the construct. It is likely the case that this is due to the complex nature of the construct as well as the many different ways that it has been used to meet the needs of those who have studied it.

**Flow and PIU**

One of the first studies that examined flow’s potential to lead to problematic internet behaviors was conducted by Chou and Ting (2003). Due to intrinsically motivating quality of the flow experience, they tested whether or not flow is a mechanism that when paired with behavioral repetition leads to addiction in online gaming. In order to get a sample of active online gamers the researchers contacted 1000 members of the five most active online game clubs in Taiwan and had them fill out a measure of flow, a measure of addiction, and questionnaire assessing how long they have playing online games and for how many hours a week. In total,
395 participants completed the surveys. Based on the results, the authors concluded that flow had an overwhelming impact on addictive behaviors even after controlling for the effect of behavioral repetition. They further concluded that habit formation or addiction to gaming is due to flow.

Despite the number of studies that have cited Chou and Ting’s study as evidence that flow leads to addiction, there are a couple of limitations in this study. First, the authors made causal conclusions from a self-report correlation study that was conducted at only one point in time. Second, they only surveyed highly active gamers in their sample, so their conclusions may not apply to the general population. Nonetheless, Chou and Ting’s (2003) research does suggest that the experience of certain flow elements may be problematic for some online gamers. The question still remains whether or not it is the flow experience itself, or rather the built in aspects of online games that more responsible for this relationship. Moreover, at the time of Chou and Ting’s study it was not clear whether specific elements of the flow experience are more related to problematic outcomes than others.

Recent research has more specifically addressed which constituent elements of flow are related to PIU. Bridges and Florsheim (2008) studied the relationship between flow and PIU in a sample of online shoppers. The authors wanted to determine whether or not certain aspects of the flow experience lead to PIU. They believed that flow elements that lead to PIU would also relate to hedonic (for fun) shopping values, whereas utilitarian (for a specific purpose) shopping values would be related to an increase in purchasing. They identified time distortion, telepresence, arousal, and challenge as being the flow elements most likely to be related to PIU due to their relation to hedonic shopping values. Time distortion and telepresence were found to
be strong predictors of PIU, whereas arousal and challenge were unrelated to PIU. These findings are especially relevant in that they demonstrate that not all elements of the flow experience are equally related to PIU.

In other flow research, Qin, Rau, and Zhong (2007) found flow, behavioral repetition, and the gamers’ psychological profile to be related to internet gaming addiction. Through regression analysis they determined that behavioral repetition was the primary mechanism at play in the development of internet gaming addiction and flow was a facilitating factor. Park and Hwang (2009) looked at the role flow and presence plays in online game addiction. They defined presence as the feeling that nothing is mediating gamers’ experience of the game so that the person feels as though they are actually physically in the game world. Preliminary analyses indicated that flow and presence were positively related to both entertainment and online gaming addiction. Further analysis revealed that flow mediated the relationship between presence and online gaming addiction. Thatcher, Wretschko, and Fridjhon (2008) also looked at the association between online flow experiences, PIU, and internet procrastination. They found a strong positive correlation between PIU and online procrastination, and a moderate positive correlation between online flow experiences and PIU. Further analyses revealed that the relationship between PIU and flow experiences is significantly stronger if the internet is being used to procrastinate and weaker if this is not the case.

It should be noted that not all researchers have found a positive relationship between flow and PIU. Wan and Choiu (2006) examined the relationship between flow and internet gaming addiction in a 6 month longitudinal study. They found the relationship between flow and addiction to be stable over the six month period. Contrary to expectations, flow was negatively
correlated with internet gaming addiction with addicts’ scores on the flow state scale being significantly lower than non-addicts’. The authors concluded that the data indicates that the mutual predictive relationship between flow and online gaming addiction does not exist.

In summary, flow remains a concept that is not measured or conceptualized in a consistent fashion. Moreover, there is not clarity in the way in which flow is related to problematic or addictive behaviors in internet activities. One way to address this concern and shed light on the potential relationship between the flow experience and PIU is to look at the factors or constructs that are thought to make up the experience of flow and examine whether or not these specific factors are related to PIU. In this way, research may be able to determine, with some degree of confidence, what specific aspects of flow have the most potential to be problematic, and which are generally benign regardless of the conditions surrounding the experience of flow. The present study will examine time distortion and telepresence as prior research has suggested they are the most problematic flow elements (Bridges & Florsheim, 2008).

**Time Distortion**

Time distortion is thought to arise within the flow experience when people are so immersed in the task at hand that they lose their sense of time. When they do check the time after the completion of the activity they come to the realization that either a great deal of time has passed or almost no time has passed at all. Prominent researchers in this field have suggested that the most common time distortion experience is to feel as though time has passed quicker than expected or perceived (Jackson & Elkund, 2002). Time distortion was identified as a common event by participants in one of the first internet addiction studies and was found to be
related to negative consequences, even among persons who are not dependent on the internet (Young, 1998). A similar finding was found by Greenfield (1999), who identified 5.7% of the sample as exhibiting a compulsive internet use pattern, which was characterized by “disinhibition, accelerated intimacy, dissociation (time distortion), lack of boundaries, and other alterations in mood and consciousness” (Greenfield, 1999, p. 9).

A more recent example of research looking at the effects of time distortion in internet related activities was conducted by Raul, Peng, and Yang (2007). They had novice and expert gamers play the role playing game Diablo II for 30, 60, or 90 minute intervals. At the completion of the sessions, participants filled out a questionnaire, which among other things asked them to estimate the amount of time they had just played the game. The results of the study showed that both novice and expert game players were prone to underestimating how long they had played. The researchers also observed that many participants in the study found it difficult to stop playing the game without outside influence.

In summary, time distortion is an experience that has often been found to be related to problematic internet behaviors. This general finding is not surprising when one considers the many time demands placed on the modern individual and the conflicts that can arise if a particular activity consistently takes more time than expected. The question remains if a subjective distortion in time perception is fundamentally linked to negative outcomes or not.

Telepresence

Another concept related to the flow experience that may contribute to PIU for some individuals is telepresence. Telepresence was first written about by Marvin Minsky (1980), who used the term to refer to the experience of interacting with a teleoperator system (robotic device
controlled from a distance by a human operator). Later Steur (1993) differentiated between presence and telepresence. Presence he defined “as the sense of being in an environment” (Steur, 1993, p. 6). Telepresence was defined “as the experience of presence in an environment by means of a communication medium” (Steur, 1993, p. 6). Thus the primary difference between these two concepts is telepresence is the experience of presence through a medium such as a computer or smart phone, whereas presence is a more natural experience that only requires one’s senses or imagination. Due to the mediated nature of telepresence, the experience is influenced by the vividness and interactivity of the medium (Hoffman & Novak, 1996). To put this in another way, the experience of telepresence is more likely if the technology responds quickly, is complex in nature, and is stimulating to the senses.

Due to advances in internet connection speed, graphic design, processing speed, and technology in general, the difference between presence and telepresence in internet based activities is less now than ever before. Since the present study will deal exclusively with the subjective experience of presence in a mediated environment, and for the sake of consistency, the term telepresence will be used to refer to any experience that gives the internet user the feeling of “being there.”

Present Study

Flow appears to be a concept that despite a good deal of research does not have a consistent definition or way of measuring it in relation to internet activities. Therefore this study examined the flow elements time distortion and telepresence, two flow elements that have been specifically linked to PIU in previous research (Bridges & Florsheim, 2008; Chou & Ting,
More specifically it looked at whether or not the relationship between time distortion/telepresence and PIU is moderated by OP for the internet related activity in question.

Moderation was chosen instead of mediation as the hypothesized way in which OP influences the relationship between these flow elements for a couple reasons. First, there have been a number of contradictions in the literature regarding flow’s relationship to PIU. The flow experience seems at odds with addiction as it is often viewed as an important part of living a balanced and meaningful life (Voiskounsky, 2009). Yet several research studies have found flow to be positively related to PIU (Chou & Ting, 2003; Kim & Davis, 2009; Park & Hwang, 2009; Qin, Rau, & Zhong, 2007; Thatcher, Wretschko, & Fridjhon, 2008). Still others have found flow to be negatively related to PIU (Wan and Choiu, 2006). This suggests that flow is sometimes negatively to PIU, and other times positively related to it. A moderation analysis would determine if the presence or absence of OP would influence the strength and direction of flow’s relationship to PIU. Second, a number research studies have directly supported that the strength of flow’s relationship to PIU is influenced by outside factors. Thatcher, Wretschko, & Fridjhon (2008) found that whether or not their participants were using the internet to procrastinate was a significant factor in how related flow was to PIU. Similarly, Przybylski, Weinstein, Ryan, and Rigby (2009) found that OP moderated the relationship between hours of play and life satisfaction, mental health, and post play energy. Since both PIU and internet addiction researchers agree that PIU should be defined in terms of the negative consequences it has for the person in question (Caplan, 2002; LaRose, Lin, & Easton, 2003; Shapira et al., 2003; Young, 1998), it stands to reason that the presence of OP in an individual has the potential to
transform a mildly problematic activity into a serious issue and similarly transform a healthy activity into a problematic one.

For these reasons the data were originally examined with a moderation analysis. Therefore, the two hypotheses of the study were:

H1: OP moderates the relationship between time distortion and PIU.

More specifically, it was hypothesized that the positive relationship between time distortion, the first independent variable (X1), as measured by the flow scale used by Lee and Chen (2010), and PIU, the dependent variable (Y), as measured by the GPIUS-2 will be moderated by OP, the moderator (Z), as measured by the passion scale.

H2: OP moderates the relationship between telepresence and PIU.

More specifically, it was hypothesized that the positive relationship between telepresence, the second independent variable (X2), as measured by the flow scale used by Lee and Chen (2010), and PIU, the dependent variable (Y), as measured by the GPIUS-2 will be moderated by OP, the moderator (Z), as measured by the passion scale.

**Method**

**Participants**

The sample consisted of 131 university students, ages 18-22 (M=20.11; SD= 1.13) recruited through Xavier University’s participant pool. The sample consisted of 84.7% Caucasian (n=111), 4.6% Latino/Hispanic (n=6), 3.8% Asian American (n=5), 3.8% African American (n=5), 2.3% Biracial (n=3), and 0.8% of students who identified as other (n=1). The only inclusionary criteria for the participants were that they must be between the ages of 18 and 29 and they must have used the internet. A power analysis based on Cohen and Cohen’s (1983)
criteria for a multiple regression analysis was conducted to determine the necessary sample size needed to detect a medium effect $d=.3$, a significance criteria of .05, and a power between .90 and .95. This range of power was used instead of the more typical .80 due to documented power problems with moderated multiple regression in non-experimental designs (Aguinis, 1995; Cohen & Cohen, 1983; Frazier, Tix, & Barron, 2004).

**Measures**

**Demographic information.** A demographic data questionnaire (Appendix A) was utilized to collect information regarding the participant’s background and internet use patterns. This questionnaire was constructed from demographic forms used in recent studies examining the internet use patterns of young adults in the US (Caplan, Williams, & Yee, 2009; Lenhart, Purcell, Smith, & Zickuhr, 2010). This questionnaire included questions about the participant’s sex, age, ethnicity, year in college, estimated hours of internet use per week, frequency of internet use, types of internet activities engaged in, and how the internet is usually accessed.

**Problematic internet use.** Problematic Internet Use (PIU) was measured with the Generalized Problematic Internet Use Survey 2 (GPIUS-2; Appendix B). In the present study the GPIUS-2 was answered with a 49 point visual analogue scale (VAS; Reips & Funke, 2008). According to Reips and Funke (2008), a VAS is a continuous variable measurement device that consists of a line with anchors located at each end. The two anchor points for this scale were labeled “strongly disagree” and “strongly agree”. Participants were asked to select their level of agreement to the items by clicking on the line (slider scale) located below each item with their mouse. A VAS was used because it is an uncomplicated and straightforward way to measure items with a high number of response options. A 49 point scale was chosen to account for the
negative effect on power that “scale coarseness” (using a scale to measure the dependent variable that does not include all theoretically possible responses) can have in moderated multiple regression (Aguinis, 1995).

In the initial study validating the measure, all five of the subscales had Chronbach’s alpha exceeding $\alpha = .80$ and when summed, the scales reliability estimate was $\alpha = .91$ (Caplan, 2010). Caplan also used a confirmatory factor analysis to test the construct and nomological validity. Caplan’s data fit well with the proposed model, leading him to conclude that the scale has sufficient validity in these areas. Caplan also concluded that the GPIUS-2 is a more valid measure of PIU than its predecessor because it was able to account for vastly more variance in participant’s scores than previous studies using the GPIUS (Caplan, 2003, 2005). Yu (2011) also examined the GPIUS-2 with regards to its psychometric properties and found the measure to have adequate reliability, convergent validity, and divergent validity.

**Obsessive passion.** The proposed moderator variable OP was measured with the Passion Scale (Appendix C). The Passion Scale was originally developed by Vallerand et al., (2003) as a 34 item measure with questions designed to reflect the definition of the two proposed forms of passion. The Passion Scale’s reliability and validity has been supported by a number of internet based studies that have used various versions of the measure (Lafreniere, Vallerand, Donahue, and Lavigne, 2009; Tosun & Lajunen, 2009; Vallerand, 2008; Wang & Yang, 2006; 2008). The version of the Passion Scale that was used in this study is a 17 item measure that consists of six questions related to HP, six questions relating to OP, and five questions that are used to determine whether or not the activity in question is a passion. This updated version of the scale correlates highly with the original scale. Moreover, the OP and HP subscales for the updated
version have the same relationships to outcome variables as the original scale. However, the OP and HP subscales on the updated measure have lower correlations to one another than on the original scale, which suggests better discriminant validity. This is the only scale in existence that measures one’s passion for activities. This particular version was used because it is the one made available by the author’s for researchers (Vallerand, Personal communication). Before completing the measure, participants were asked to identify their favorite internet activity. They were then asked to answer all questions pertaining to their favorite internet activity for both the passion and flow measures.

**Time distortion and telepresence.** The independent variables time distortion and telepresence were measured with the flow measure used by Lee and Chen (2010) to study the effect flow has on consumer behavior (Appendix D). The decision to use this flow measure was based upon the fact that this conceptualization of flow has consistently been linked to PIU behaviors. Moreover, this conceptualization of flow is the only one that includes both time distortion and telepresence. Lee and Chen’s (2010) version of this survey was chosen because of its high reliability coefficients for both the time distortion ($\alpha=.84$) and telepresence ($\alpha=.95$) subscales. The items for time distortion, telepresence, concentration, and enjoyment scales were changed with regard to their wording to reflect the participant’s self-identified favorite internet activity. For example, an item originally worded, “I found my online shopping fun” will now read “I find my favorite internet activity fun”. Changing the wording of the items in this manner is a common practice within this research tradition (Bridges & Florsheim, 2008; Chou & Ting, 2003; Lee & Chen, 2010).
The time distortion and telepresence scales that were used in this study were originally developed by Novak, Hoffman and Yung (2000). For the time distortion subscale, pilot testing determined that the two item scale had a reliability coefficient of $\alpha = .70$ (Novak, Hoffman, & Yung, 2000). In the Chou and Ting (2003) study, the time distortion subscale was increased to three items and this change increased the reliability coefficient to $\alpha = .79$. The seven item telepresence scale was modified from a survey developed by Kim and Biocca (1997). In the Chou and Ting (2003) study the telepresence scale was reduced to five items and yielded a reliability coefficient of $\alpha = .87$. Lee and Chen (2010) further revised these subscales in their research on online consumer behavior. They used a five item telepresence scale ($\alpha = .95$) and a two item time distortion subscale ($\alpha = .84$). After conducting comparative analyses of each of the scales they used in the study.

**Procedure**

This study was approved by the Xavier University Institutional Review Board (IRB; Appendix E). After approval, undergraduate students at Xavier University were recruited by a posting about the study on the participant pool bulletin board. The posting included information about the study, a statement ensuring confidentiality, and had paper tags with information on how to access the study online that the participants could take. The study itself was located on an internet based survey system (checkbox.com) and the participants entered their responses anonymously. Participants were instructed to complete the surveys without the assistance of others. After viewing the informed consent page participants who choose to continue with the study were then directed to the demographics questionnaire, which was then followed by the GPIUS-2 (Caplan, 2010), the passion scale (Vallerand et al., 2003), and the flow survey (Lee &
Chen, 2010) in this order. The GPIUS-2 was given before the passion scale and flow survey so the participant’s responses on the GPIUS-2 will not be influenced by the content of these measures. The passion scale was given before the flow scale because the passion scale included a question pertaining to one’s favorite internet activity, which was the basis for all responses on each measure. After participants completed these measures, they were then presented with a debriefing page (Appendix F). Finally the participants were directed to another website that had no connection to the original on which they provided the information necessary to receive credit for participation.

Results

The sample’s average PIU score was 226.54 with a standard deviation of 105.39 (Table 1 lists the means and standard deviations of all the variables in this study). This PIU average score was achieved by summing the scores of the 15 item GPIUS-2 measured on a 49 point scale. To compare the PIU scores to other samples, they were first converted to a per item average. This involves dividing 226.54 by 15 (226.54/15=15.10) which results in an average score of 15.10 out of a possible 49 for each response. Caplan’s (2010) reported mean PIU item score was 2.2 (SD=1.18). Since Caplan (2010) used an 8 point likert type scale to compare the scores it was necessary to divide 15.10 by 49 then multiply it by 8 (15.10*8/49=2.47) yielding a mean PIU mean score of 2.47 for each item. When this sample was further compared to Caplan’s (2010) using an independent sample T test it was found that the current sample is significantly higher than Caplan’s (2010) at the 95% confidence level, but not the 99% confidence level. As such, the current sample endorses PIU symptoms that are slightly higher (2.47 vs 2.2) than the sample
that the GPIUS-2 was first validated on. Caplan, Williams, and Yee (2009) also used the GPIUS-2 in their research but did not report participant’s PIU scores.

Both hypotheses were tested using moderated multiple regression analyses with PIU as the dependent variable (DV) and OP as the moderator variable (MV). Time distortion was the independent variable (IV) for hypothesis one and telepresence the independent variables for hypothesis two. To conduct moderated multiple regression, first the MV and IV were centered. Next, these two variables were multiplied together to create a product term. Then the variables were entered into the regression equation with the centered IV, followed by the centered MV, and then the product term was added to the equation as suggested by Baron and Kenny (1986). Then a single degree of freedom F test was used to determine if the regression equation with the product term accounted for significantly more variance than the additive effects of the IV and MV alone.

The first hypothesis tested in this way (OP moderates the relationship between time distortion and PIU) was not supported as the proposed interaction effect was not significant $F(1,127) = .636, p = .427$ (Table 2). Similarly the second hypothesis (OP moderates the relationship between telepresence and PIU) was also not supported as the interaction effect was not significant $F(1, 127) = 2.59, p = 1.09$ (Table 3). Since no interaction effect was found, it was unnecessary to run a simple slopes test to determine if the proposed interaction was moderation.

Two post hoc analyses were run using SPSS to determine if OP mediated the relationship between time distortion (hypothesis 3)/telepresence (hypothesis 4) and PIU. According to Baron and Kenny (1986), to measure whether or not a variable mediates the relationship between the IV and DV, several conditions must be met. First the IV and the proposed mediator variable must
be significantly related (path a). Second, the mediator variable must be significantly related to the DV (path b). Third, the IV and DV must be significantly related (path c). Fourth, when both the dependent variable and the mediator variable are entered into the regression equation together (thereby controlling for path a and path b) the relationship between the IV and DV is no longer significant (path c’). If path c’ is reduced to zero then there is evidence of a “potent” mediator. In psychology research this reduction to zero is a somewhat impossible standard to achieve. Especially since one of the requirements of mediation is the mediator variable and the IV are correlated, which results in multicollinearity when both are entered into the regression equation together. Multicollinearity results in a reduction of power, which in turn underestimates the mediating effect.

To test the partial mediating effect that OP has on the relationship between time distortion and PIU a series of regression equations were performed (Table 4). First OP was regressed on time distortion and the correlation was significant \((p < .001; r = .41)\), thus fulfilling the path a requirement. Second OP was regressed on PIU and the correlation was significant \((p < .001; r = .52)\), thus fulfilling the path b requirement. Third, time distortion was regressed on PIU and the correlation was significant \((p < .001; r = .34)\), thus fulfilling the path c requirement. Finally, OP and time distortion were regressed on PIU together (thereby controlling for the effect of OP on PIU). The resulting beta regression coefficient \((B; \text{allows measurement of time distortion’s relationship to PIU after accounting for the contribution of OP})\) of time distortion and PIU was no longer significant \((p = .069; B = .15)\). In other words, when OP was entered into the regression equation the relationship between time distortion and PIU reduced from significance \((p < .001; B = .347)\) to non-significance \((p = .069; B = .15)\), thus fulfilling the path c’ requirement.
for partial mediation. Furthermore, the path c’ regression equation produced an $R^2 = 0.29$, opposed to a $R^2 = 0.12$ for the path c regression equation. In other words, the addition of OP to the regression equation resulted in a 17% increase in the amount of variance accounted for in the PIU scores of the participants. These findings provide sufficient evidence that OP partially mediates the relationship between time distortion and PIU.

To test the mediating effect that OP has on the relationship between telepresence and PIU, the same analytic strategy was used (Table 5). First OP was regressed on telepresence, and the correlation was significant ($p<.001; r = .45$), thus fulfilling the path a requirement. Second OP was regressed on PIU and the correlation was significant ($p<.001; r = .52$), thus fulfilling the path b requirement. Third, telepresence was regressed on PIU and the correlation was significant ($p<.001; r = .30$), thus fulfilling the path c requirement. Finally, OP and telepresence were regressed on PIU together (thereby controlling for the effect of OP on PIU). The resulting beta regression coefficient ($B$; allows measurement of telepresence’s relationship to PIU after accounting for the contribution of OP) of telepresence and PIU was no longer significant ($p=.30; B = .087$). In other words, when OP was entered into the regression equation the relationship between telepresence and PIU reduced from significant ($p<.001; B = .302$) to non-significant ($p=.30; B = .09$), thus fulfilling the path c’ requirement for partial mediation. Furthermore, the path c’ regression equation produced an $R^2 = .186$, opposed to a $R^2 = .091$ for the path c regression equation. The addition of OP to the regression equation resulted in a 9.5% increase in the amount of variance accounted for in the PIU scores of the participants. These findings provide sufficient evidence that OP partially mediates the relationship between telepresence and PIU.
Discussion

The original hypotheses of this study, which examined whether OP moderates the relationship between time distortion/telepresence and PIU were not supported. However, two post hoc hypotheses examining whether or not OP mediates the relationship between time distortion/telepresence and PIU were supported. As such, this study demonstrates that, for at least one college student sample, the relationship between certain flow elements and PIU is in part dependent on whether or not the person has OP for their favorite internet activity. This finding brings into question the conclusions of researchers who have found correlations between flow and PIU (Chou & Ting, 2003; Raul, Peng, & Yang, 2007) as two of the flow components identified as most related to PIU (time distortion and telepresence) were not significantly related to PIU after accounting for OP. It would appear that at least for some internet users, the important factor in whether or not the experience of time distortion and telepresence are problematic is in part due to how the person approaches the activity. This finding is more in line with how flow is generally conceptualized as an important part of living a balanced and meaningful life (Voiskounsky, 2008).

These findings also shed some light on the confusing literature on flow’s relationship to PIU. For example, Chou and Ting’s (2003) study found a strong positive correlation between flow and internet gaming addiction. However, they recruited their sample from five of the most active online gaming clubs in Taiwan. While the researchers did not specifically look at the type of passion these participants had for their online gaming, these clubs presumably have a high
proportion of problematic gamers. Therefore, it stands to reason that many of the members of Chou and Ting’s sample approached their game play in the compulsive manner that characterizes OP. Unfortunately, while Chou and Ting asked participants how often they play online games they did not report these statistics. A somewhat comparable sample by Caplan, Williams and Yee (2009) looking at Everquest (a popular online role playing game) players from the United States identified by tracking their participants gameplay patterns that the participants’ in their sample played an average of 25.69 hours per week. In contrast, in the current study, participants reported a relatively modest average of 15.48 hours a week on the internet and the most commonly endorsed favorite internet activity was some form of social media (i.e. facebook, twitter, pinterest, reddit, tumblr).

This study has a number of limitations. First and foremost the variables in this study were examined using self-report questionnaires. This common shortcoming of many research studies is especially problematic in studying time distortion and telepresence due to the poor quality of the measures currently available. For instance, only one time distortion measure adapted for internet activities in existence has a reliability coefficient above .80 (Lee & Chen, 2010). Moreover, since flow is an experience that only occurs when someone is fully engaged in an activity, it may be more appropriate to study it using a variation of the experience sampling method developed by Larson and Csikszentmihalyi (1987). Another limitation is that this study utilized a convenience sample of a highly homogenous college aged population, which limits the generalizability of the findings.

With regard to the non-significant findings of the moderation analyses, several factors could be responsible. First, the power of a moderation analysis is largely dependent upon the
reliability and validity of the questionnaires used to measure it. While the telepresence and time distortion questionnaires adapted for use in the present study were the most reliable measures available, they only had a reliability of .84 for time distortion. According to Aguinis (1995), a reliability coefficient of .80 of a measure is sufficient to cut the power of a MMR analysis by half. Second, MMR in non-experimental designs is notorious for type 2 errors (failing to detect a significant relationship that is present due to power problems). The present study attempted to account for this issue, but it is possible that it was insufficient. Third, it is also possible that OP does not moderate the relationship between time distortion/telepresence and PIU. Nonetheless, a post hoc analysis revealed that OP does partially mediate the relationship between time distortion/telepresence and PIU.

A number of gaps exist in the research literature on flow’s relationship to PIU. For instance, there exist a myriad of different conceptualizations of flow in internet related studies (Finneran & Zhang, 2005). Among these perspectives on flow there is little conceptual overlap, making it impossible to determine if flow researchers are studying the same phenomenon. Future research in this area could address this issue by using multiple measures of flow to determine whether or not commonly used flow measures are highly correlated to one another and are related to other variables in the same way. Another area that future research could address is looking at whether or not the nature of flow’s relationship to PIU differs depending on the activity that the internet user usually engages in. In this way it can be determined whether or not particular activities are generally more problematic than others. In this study, OP accounted for 17% of the variation in the relationship between time distortion and PIU and 9.5% of the variation in the relationship between telepresence and PIU. While this is a relevant finding, the
numbers suggest OP is not the only variable that influences this relationship. Future researchers could expand upon this study by including other possibly relevant variables to this model and determine if more variance in the relationship between specific flow elements and PIU can be accounted for.

Lastly, many researchers have lamented on the poor quality of much of the online research into flow (Finneran & Zhang, 2005; Hoffman & Novak, 2009). In part, this could be addressed by conducting more studies that focus specifically on individual flow elements. Improved understanding of flow for online activities will not be possible until flow researchers come to some degree of consensus on what flow actually is and integrate past findings into a measure or measures that are more reliable and psychometrically valid. In many ways, future flow researchers can learn from how Caplan (2002; 2003; 2005; 2010) integrated findings from internet addiction and PIU research into a conceptual model and measure that allows accurate and consistent measurement of the construct. Once flow’s measurement problem has been addressed, future researchers could further improve flow research by conducting studies that are experimental and longitudinal in nature.

Moreover, with the advent of smart phones, tablets and other handheld devices capable of connecting to the internet, it is now possible to utilize the experience sampling method in measuring flow. Raul, Peng, and Yang (2007) had participants play the video game Diablo II for a specified period of time then asked them to report how long they were playing is an example of what future researchers could do. This provided a “real time” measure of time distortion and serves as an example of an ecologically valid way of studying a subjective distortion in time perception. Research designs of this nature could easily be adapted to studying internet activities
that are more widely used by the general population than online gaming. For instance, social media has changed how most people interact with one another and contributes to more time being spent online than ever before. With PIU increasingly becoming a problem there is a need to understand how attributes such as OP can turn potentially enjoyable and meaningful activities into problematic ones. Shedding light on what contributes to PIU with improved research designs and sampling methods will go a long way towards improving the assessment of, and treatment methods for, people struggling to manage their online behavior. These methods would also help move this research tradition away from an overreliance on self-report measures and correlational research. This may result in a better understanding of the online flow experience and how to prevent PIU.
References


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http://jcmc.indiana.edu/vol3/issue2/kim.html

http://dx.doi.org/10.1016/j.chb.2008.11.001


Table 1

Means (M) and Standard Deviations (SD) of Problematic Internet Use (PIU), Obsessive Passion (OP) Telepresence (TELE), and Time Distortion (TD), N=131

<table>
<thead>
<tr>
<th>Variable</th>
<th>PIU</th>
<th>OP</th>
<th>TD</th>
<th>TELE</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>226.54</td>
<td>10.68</td>
<td>8.18</td>
<td>9.19</td>
</tr>
<tr>
<td>SD</td>
<td>105.39</td>
<td>4.70</td>
<td>3.08</td>
<td>4.61</td>
</tr>
</tbody>
</table>
Table 2
*Moderation Effect of Obsessive Passion (OP) on the Relationship between Time Distortion (TD) and Problematic Internet Use (PIU), N=131*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>Lower</th>
<th>Upper</th>
<th>R² Change</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP</td>
<td>.49a</td>
<td>6.85a</td>
<td>15.25a</td>
<td>--</td>
<td>&lt;.001a</td>
</tr>
<tr>
<td>TD</td>
<td>.13a</td>
<td>-1.21a</td>
<td>10.37a</td>
<td>.290b</td>
<td>.120a</td>
</tr>
<tr>
<td>OP X TD</td>
<td>-0.68a</td>
<td>-1.80a</td>
<td>.76a</td>
<td>.00a</td>
<td>.427a</td>
</tr>
</tbody>
</table>

* These values are from the hierarchical regression equation as suggested by Baron and Kenny (1986) with the centered IV (TD) entered first, followed by the centered MV (OP), and then the product of OP and TD.

* This value represents the R² change when TD and OP are entered into the equation together without the product term.
Table 3

*Moderation Effect of Obsessive Passion (OP) on the Relationship between Telepresence (TELE) and Problematic Internet Use (PIU), N=131*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>Lower</th>
<th>Upper</th>
<th>R² Change</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP</td>
<td>.53&lt;sup&gt;a&lt;/sup&gt;</td>
<td>7.89&lt;sup&gt;a&lt;/sup&gt;</td>
<td>15.67&lt;sup&gt;a&lt;/sup&gt;</td>
<td>--</td>
<td>&lt;.001&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>TELE</td>
<td>.11&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-1.29&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.38&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.28&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.191&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>OP X TELE (Interaction)</td>
<td>- .13&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-1.34&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.14&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.01&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.109&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> These values are from the hierarchical regression equation as suggested by Baron and Kenny (1986) with the centered IV (TELE) entered first, followed by the centered MV (OP), and then the product of OP and TD.

<sup>b</sup> This value represents the R² change when TELE and OP are entered into the regression equation together without the product term.
### Table 4

**Mediation Effect of Obsessive Passion (OP) on the Relationship between Time Distortion (TD) and Problematic Internet Use (PIU), N=131**

<table>
<thead>
<tr>
<th>Regression paths</th>
<th>B</th>
<th>r</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mediation path a (TD on OP)</td>
<td>--</td>
<td>.43</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Mediation path b (OP on PIU)</td>
<td>.46</td>
<td>.52</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Total effect, c path (TD on PIU)</td>
<td>.35</td>
<td>.35</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Direct effect c’ (TD on PIU including OP as mediator)</td>
<td>.15</td>
<td>--</td>
<td>.069</td>
</tr>
</tbody>
</table>

a Are effects that need to be significant ($p \leq .05$) to meet the criteria for mediation according to Baron and Kenny (1986).

b Is the effect of TD on PIU when OP is introduced as a mediator. According to Baron and Kenny (1986), to meet the criteria for partial mediation the significance of the relationship between TD and PIU must be reduced to non-significance ($p > .05$).
Table 5

*Mediation Effect of Obsessive Passion (OP) on the Relationship between Telepresence (TELE) and Problematic Internet Use (PIU), N=131*

<table>
<thead>
<tr>
<th>Regression paths</th>
<th>B</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mediation path a (TELE on OP)</td>
<td>--</td>
<td>.45</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Mediation path b (OP on PIU)</td>
<td>.48</td>
<td>.52</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Total effect, c path (TELE on PIU)</td>
<td>.30</td>
<td>.30</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Direct effect c' (TELE on PIU including OP as mediator)</td>
<td>.09</td>
<td>--</td>
<td>.302</td>
</tr>
</tbody>
</table>

a Are the effects that need to be significant (p ≤ .05) to meet the criteria for mediation according to Baron and Kenny (1986).

b Is the effect of TELE on PIU when OP is introduced as a mediator. According to Baron and Kenny (1986) in order for OP to qualify as a partial mediator the significance of the relationship between TELE and PIU must be reduced to non-significance (p > .05).
Appendix A

Demographics Questionnaire

1. Please enter the following information:

   Age: _______

   Sex: _______

2. Ethnicity:

   Caucasian

   African American

   Asian American

   Latino/ Hispanic

   Native American

   Biracial

   Other (Please Specify) __________________

3. Year in college:

   1st

   2nd

   3rd

   4th

   5th and beyond

4. In a typical week, how many hours do you spend on the Internet (not counting for school or work) ________
5. Overall, how often do you use the internet?

   Several times a day
   Once a day
   Only 3-5 days a week
   Only 1-2 days a week
   Less than once per week

To answer the following questions, use this scale: (1) never; (2) very rarely; (3) rarely; (4) occasionally; (5) frequently; (6) very frequently

6. Over the past 6 months, how often have you used the internet to:

   Access news or information _________
   Use online social media sites (i.e., MySpace, Facebook, Twitter) _________
   Play online video games _________
   Download or access music, videos, and/or software _________
   Purchase products online _________
   Gamble online _________
   Share something online that you created yourself (i.e. blog, artwork, videos) _________
   Meet new people (i.e., chat rooms, dating websites) _________

7. Over the past 6 months, how often have you connected to the internet with a:

   Cell phone or a device that is also a cell phone (i.e., Blackberry, iPhone) _________
   Desktop or laptop computer and/or macbook _________
   Gaming console or portable gaming device (i.e., PS3, Xbox 360, Wii, PSP) _________
   Smart tv, tablet, mp3 player, and/or e-reader (i.e., Ipad, Kindle, Ipod) _________
Appendix B

Problematic Internet Use Survey (GPIUS-2)

The Problematic Internet Use Survey (GPIUS-2) is protected by copyright so it is not reproduced in this document. This measure is available through Science Direct.
Appendix C

The Passion Scale

The Passion Scale adapted for use in this study is protected by copyright so it is not reproduced in this document. This measure is available through the Research Laboratory on Social Behavior.
Appendix D

Flow Survey

The flow survey adapted for use in this study is protected by copyright so it is not reproduced in this document. The original measure is available through the International Association for Computer Information Systems.
Appendix E

IRB Approval Letter

October 22, 2012

Ryan Wagner
6601 Beechmont Ave. Apt. 39
Cincinnati, OH 45230

Re: Protocol #1229, *The Relationships Among Flow, Passion and Problematic Internet Use*

Dear Mr. Wagner:

The IRB has reviewed the materials regarding your study, referenced above, and has determined that it meets the criteria for the Exempt from Review category under Federal Regulation 45CFR46. Your protocol is approved as exempt research, and therefore requires no further oversight by the IRB. We appreciate your thorough treatment of the issues raised and your timely response.

If you wish to modify your study, including the addition of data collection sites, it will be necessary to obtain IRB approval prior to implementing the modification. If any adverse events occur, please notify the IRB immediately.

Please contact our office if you have any questions. We wish you success with your project!

Sincerely,

Morell E. Mullins, Jr., Ph.D.
Chair, Institutional Review Board
Xavier University
Appendix F

Debriefing Statement

Thank you for your time!

You have just completed a research study examining different factors related to problematic use of the internet. This study was designed to clarify the relationships between problematic internet use and the feelings and experiences people have when they engage in their favorite internet activity. The primary purpose of this study is to add to the research literature on this topic. Your responses related to this research study are anonymous. The personal information you are being asked to provide on this page is for the sole purpose of awarding research credit to you for your participation. Your identifying information will in no way be linked to your responses and it will not be stored on the same database. Any questions can be directed to Ryan Wagner at wagnerr2@xavier.edu or at (517)673-2852. You may also call his dissertation chair and licensed clinical psychologist, Dr. Nicholas Salsman at (513)745-4289. Any questions regarding your rights as a research participant should be directed to the Xavier University Institutional Review Board at (513)745-2870.

In order to receive research credit for your participation in this study, please click on the link below:

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Summary

Title: The Relationships among Flow, Passion, and Problematic Internet Use

Problem. Over the past two decades, use of the internet has grown exponentially (Morahan-Martin, 2005; File, 2013). One consequence of increased internet use is that more people each year are having difficulty regulating their internet use (Christakis, 2011). One factor that has been proposed as a causative mechanism in the development of problematic internet use (PIU) is flow (Chou & Ting, 2003). According to Csikszentmihalyi (1990) flow is a psychological state that is characterized by being fully immersed in the task at hand to the extent that nothing else matters. While not a universal finding, several internet based studies have found a positive relationship between flow and PIU (Chou & Ting, 2003; Kim & Davis, 2009; Park & Hwang, 2009; Qin, Rau, & Zhong, 2007; Thatcher, Wretschko, & Fridjhon, 2008). However, this view of flow as a precursor to addictive behaviors stands in contrast to the more common view of the construct as an optimal psychological experience that is essential part of living a meaningful life (Csikszentmihalyi, 1990; Voiskounsky, 2008).

Study of this relationship has been hampered by inconsistent measurement of both flow and PIU. However recent research has suggested that certain flow elements, specifically time distortion (losing track of time) and telepresence (feeling of being present in a mediated environment such as the internet), are more related to PIU than others (Bridges & Florsheim, 2008). The present study looked at the effect Obsessive passion (OP) had on the relationship between flow and PIU. OP is thought to arise when person internalizes a favorite activity in such a way that it becomes a substitute for their self-worth (Vallerand et al, 2003). As such, persons
with obsessive passion will engage in their chosen activity compulsively and rigidly, ignoring negative consequences that may result from their neglect of other life domains (Vallerand, 2008).

Method. 131 undergraduate students at Xavier University completed measures of PIU (Caplan, 2010), time distortion/ telepresence (Lee & Chen, 2010), and OP (Vallerand et al., 2003) on an internet based survey system (www.checkbox.com). The mean age of this group was 20.11 (SD = 1.13). The sample consisted of 84.7% Caucasian (n=111), 4.6% Latino/Hispanic (n=6), 3.8% Asian American (n=5), 3.8% African American (n=5), 2.3% Biracial (n=3), and 0.8% of students who identified as other (n=1). The sample’s average PIU score was 226.54 (SD=105.39). Participants reported using the internet for leisure an average of 15.48 hours a week.

Findings. A moderated multiple regression analysis was used to determine if OP moderates the relationship between time distortion/ telepresence and PIU. The first hypothesis tested in this way (OP moderates the relationship between time distortion and PIU) was not supported as the proposed interaction effect was not significant F(1,127) = .636, p = .427. Similarly the second hypothesis (OP moderates the relationship between telepresence and PIU) was also not supported as the interaction effect was not significant F(1, 127) = 2.59, p= .109. Since both hypotheses of this study were unsupported two post hoc analyses were run using SPSS to determine if OP mediated the relationship between time distortion/ telepresence and PIU. After accounting for the mediating effect of OP the relationship between time distortion and PIU was no longer significant (p=.069; B = .151), thus supporting the hypothesis that OP partially mediates the relationship between time distortion and PIU. Furthermore, the addition of OP to the regression equation resulted in a 17% increase in the amount of variance accounted for in the PIU scores of the participants. After accounting for the mediating effect of OP the relationship between
telepresence and PIU was no longer significant (p=.302; \( B = .087 \)), thus supporting the hypothesis that OP partially mediates the relationship between telepresence and PIU. The addition of OP to the regression equation resulted in a 9.5% increase in the amount of variance accounted for in the PIU scores of the participants.

**Implications.** The original hypotheses of this study, which looked at whether OP moderates the relationship between time distortion/telepresence and PIU were not supported. However, two post hoc hypotheses examining whether or not OP mediates the relationship time distortion/telepresence and PIU were supported. As such, this study demonstrates that for at least one college student population that the relationship between certain flow elements and PIU is in part dependent on whether or not the person has OP for their favorite internet activity. This finding brings into question the conclusions of researchers that have found correlations between flow and PIU (Chou & Ting, 2003; Raul, Peng, & Yang, 2007) as two of the flow components identified as most related to PIU (time distortion and telepresence) were not significantly related to PIU after accounting for OP. It would appear that at least for some internet users the important factor in whether or not the experience of time distortion and telepresence are problematic is in part due to how the person approaches the activity. This finding is more in line with how flow is generally conceptualized as an important part of living a balanced and meaningful life (Voiskounsky, 2008).