INTERNET ADDICTION AMONG GREEK ADOLESCENTS.
PREDICTION FROM FLOW OF INTERNET ACTIVITY AND IMPULSIVE COMPULSIVE BEHAVIOR

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&
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Impetus for this research project

• Contradictory findings regarding the prevalence of internet addiction among Greek adolescents

6.1% (Siomos et al. 2008)

1% (Tsitsika et al. 2009)

11% (Siomos et al. 2008)
Impulsive-Compulsive Behaviors and Internet Addiction

Internet Addiction

Impulsive Compulsive Behaviors

Positive Immediate Gratification Phenomenon (Marlatt & Gordon, 1985)
Internet Flow and Internet Addiction
(Chen, 2006)

• An individual who abuses the Internet must be absorbed by his Online Activity (Chen, 2006)

+ 

• As Flow defines the level the user is absorbed in the online activity (Chen, 2006), achieved through a Positive Immediate Gratification mechanism

= 

• The user must be in a state of Flow (Weibel et al, 2008)
Model of Understanding Internet Addiction
(Douglas et al, 2008)
Consequently in the present study as predictors of Internet Addiction were examined:

• Impulsive Compulsive Behaviors

• Internet Flow
Research Questions

1. What is the prevalence of Internet Addiction among Greek high school students?
2. Do Impulsive Compulsive behaviors and Internet Flow predict Internet Addiction?
3. Does impulsive compulsive behavior mediate the relationship between Flow of internet activity and levels of Internet Addiction?
Research Sample

- N = 2090 Adolescents
- Boys = 1035 (49.7%)
- Girls = 1048 (50.3%)
- Attica = 1919 (91.8%)
- Korinthia = 171 (8.2%)
- General High Schools = 1728 (82.7%)
- Technical High Schools = 362 (17.3%)
- Mean Age = 16.16
Instruments

- Internet use was assessed with:
  - *The Internet Addiction Test (Young, 1998)*
    Cronbach $\alpha = 0.91$
  - *The Young Diagnostic Questionnaire (Young, 1998)*
  - Internet Flow was assessed with:
    - *Internet Flow Questionnaire (Chen, Wigand & Nilan, 1999)* Cronbach $\alpha = 0.58$
  - Impulsivity- Compulsivity was assessed with:
    - *The Impulsive Compulsive scale of the Symptom Check List – 90 (Derogatis, 1994)* Cronbach $\alpha = 0.79$
Question 1

What is the prevalence of Internet Addiction among Greek high school students?
One sample, two different criteria

But why does this difference exist?

- 51% Healthy Users
- 11.6% High Risk Group For Internet Addiction-Abuse
- 37.1% Digitally Illiterate but mostly Rare Users
- 3.1% Internet Addicted Users
- 86.2% Digitally Illiterate, Rare and Healthy Users
- 10.7% High Risk Group for Internet Addiction
Possible Answer....

• Crosscultural Differences in cut off point scores...
• To examine this hypothesis
• We conducted ROC curve analysis to propose new cut of points...

<table>
<thead>
<tr>
<th>IAT SCORE</th>
<th>SENSITIVITY</th>
<th>1 - SPECIFICITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>50.50</td>
<td>.983</td>
<td>.082</td>
</tr>
</tbody>
</table>

IAT=0

IAT=100
Based on our results we estimate the Prevalence of IAD:

- 86.2% Digitally Illiterate, Rare and Healthy Users
- 10.7% High Risk Group for Internet Addiction
- 3.1% Internet Addicted Users
Question 2

Do Impulsive Compulsive behaviors and Internet Flow predict Internet Addiction?
Results

• In order to answer this question we performed a multiple linear regression analysis (Stepwise Method)

• All Collinearity Diagnostic Criteria were within permitable for the analysis limits (VIF < 2, Tolerance > 0,5, Condition Index < 15)
### Results

- **Internet Flow**
- **Impulsivity**
- **Compulsivity**

<table>
<thead>
<tr>
<th>Predictors</th>
<th>$B$</th>
<th>SE</th>
<th>Beta</th>
<th>$p$</th>
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</thead>
<tbody>
<tr>
<td>Flow</td>
<td>5.01</td>
<td>0.30</td>
<td>0.39</td>
<td>0.000</td>
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<tr>
<td>Impulsivity</td>
<td>6.05</td>
<td>5.90</td>
<td>0.24</td>
<td>0.000</td>
</tr>
<tr>
<td>- Compulsivity</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Results

• The analysis findings supported our initial hypotheses.
• Multiple Correlation Index was \( R = 0.52 \)
• Regression Coefficient was \( R^2 = 0.27 \)
• \textit{Adjusted} Regression Coefficient was \( R^2 = 0.27 \)
• The slope of the regression line was significantly different from zero \( \{F (1, 1442) = 265.72, p = 0.0000.\} \)
Question 3

Does Impulsive Compulsive behavior mediate the relationship between Flow of internet activity and levels of Internet Addiction?
Results

• We examined Impulsivity and Compulsivity, as proposed mediator of the effect of Flow on Internet Addiction.

• For this purpose we performed bootstrapping on the minimum recommended 1000 samples.

• We calculated the Sobel test for the total and specific indirect effects as well bias-corrected and accelerated bootstrap confidence intervals for the indirect effects as proposed by Preacher and Hayes at 2008 *.
Results seem to support our hypotheses

Table 2
Mediation of the Effect of Flow on Internet Addiction through Impulsivity Compulsivity

<table>
<thead>
<tr>
<th>Product of Coefficients</th>
<th>Bootstrapping</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BCa 99% CI</td>
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<tr>
<td></td>
<td>Lower</td>
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</table>

<table>
<thead>
<tr>
<th>Point Estimate</th>
<th>$SE$</th>
<th>$Z$</th>
<th>$P$</th>
<th>Lower</th>
<th>Upper</th>
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<tbody>
<tr>
<td>Indirect Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impulse Compulse</td>
<td>0.90</td>
<td>0.12</td>
<td>7.71</td>
<td>.001</td>
<td>0.66</td>
</tr>
<tr>
<td>Total</td>
<td>0.90</td>
<td>0.12</td>
<td>7.71</td>
<td>.001</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Note—BC, bias corrected; BCa, bias corrected and accelerated; 1,000 bootstrap samples.
Results in Picture

Internet Addiction Disorder

Direct Effects

Indirect Effects

Internet Flow

Impulsivity Compulsivity
Take Home Message

• A user who is in Flow when online
• stimulates Positive Immediate Gratification tendencies
• Which might progressively recycle and expand to other aspects of his life
• Ending either to strengthen Impulsive Compulsive manifestations that already exist, or initializing them
Take Home Message

Internet Addiction

Impulsive Compulsive Behaviors

Flow Experience

P.I.G
Thank you
Discussion: Question 1 Finding:

- The significantly lower than the U.S. Greek Cut off point in IAT Stresses:
- The need for indigenous measures (emic approach)
- The possible effect of the individualism – Collectivism Cultural Dimension
- Countries with higher individualism show a higher rate of internet adoption, because as something new, it is considered less threatening for the prevailing norm (Erumban & De Jong, 2006).
- Higher collectivism gives more modest answers to likert scales, due to less tolerance of inequality (Triandis, 1996)
- Matters of Scalar Equivalence: Collectivists direct their evaluation more toward interdependency with their in group and less to self-related issues (Triandis, 1996)
- And Less than one fourth of IAT questions refers to consequences in relations with others.