#SMSociety'22 Paper Template (Extended Abstract)

Length: 1000(min) - 1500(max) words, excluding references

Title: Facebook Push Notification as Triggers for Habit-Forming Feedback Loops

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Background:

To be successful, social media platforms (SMP) must motivate users to frequently revisit and spend time on them. They are designed as instances of persuasive technology (Purohit, Barclay & Holzer, 2020; Iosub, Andrei & Iacob, 2012) and are broadly discussed as platforms that enforce users' addiction (Brooks, 2017). To achieve habit-forming SMP adopt the "Hook" model (Eyal, 2014).

According to Eyal, (2014) users are getting hooked by SMP through four habit-forming cycles: They are triggered into SMP through triggers. Users reacting on triggers are immersed into SMP through further persuasive constructs such as "endless timeline" (Neyman, 2017). Such offerings attract users to act on the SMP, i.e., to invest in the platform. This often leads to lock-in and escapist usage patterns (Fogg & IIzawa, 2008) that are rewarded with positive psychological states.

The focus of this paper is on push notification (PN) as trigger to SMP habit-forming loops. PNs are personalized alerts (i.e. pop-up or mobile message) that appear suddenly on the screen. They are generated by an application, when the application is not open, with the aim to notify the absent user about one specific new development on the platform (i.e., new update, like, or post). PM reach users while they are performing activities outside SMPs. They are thus considered as interruptive and disturbing (Pielot, Church & Oliveira, 2014; Westermann, 2017). Furthermore, users have strong privacy concerns regarding PN. Against this background the question is how effective PN as triggers of habit-forming loops are. According to Drozd et al. (2012), PNs are effective, when users react on the PN and use the SMP beyond the activity triggered by the PN. The longer the stay of a user on a SMP and the higher his engagement is, the more successful the PN as trigger is. These effects of PNs on users are comparable to escapist use of SMP (Young et al., 2017). We denote escapist use of SMP triggered by PN as triggered escapism. From the perspective of the user, triggered escapism usually results in an unplanned overuse of SMPs. By initiating triggered escapism, the PN has successfully initiated the next habit-forming cycle: the usage of the platform and investment into it. If this escapist use results in rewarding experiences the psychological basis is laid for repetitive and addictive use of PNs.

Objective(s):

The objective is to explore the effectiveness of PNs as initiating triggers of habit-forming loops on the example of Facebook PNs. Three research questions are deduced from the "Hook" model:

- *PNs as Triggers:* Which personal traits of users favor positive reaction on Facebook PNs?
- *Triggered Escapism:* Does reaction on Facebook PNs result in triggered Facebook escapism?
- *User satisfaction:* Does triggered Facebook escapism result in a positive user experience?

To answer the research questions a research model was developed based on an extensive literature analysis. The following personal trait predictors of active PN use were deduced by referring to research on Facebook and SMP escapism:

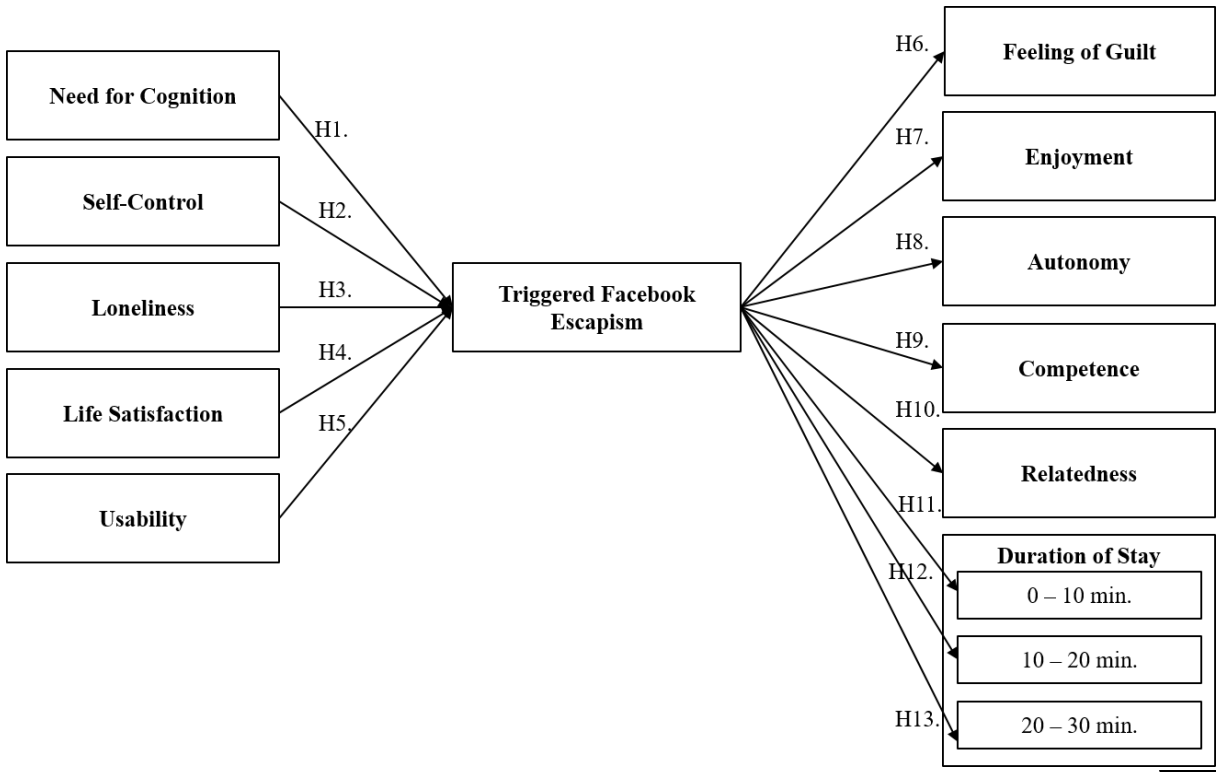
1. *Need for cognition:* According to (Meier, Meltzer & Reinecke, 2018) escapist use of Facebook can be understood as a dysfunctional avoidance coping response to negative life circumstances and relates to the desire of an effortless form of cognitive processing. Thus, need for cognition is expected to be negatively related to active PN use and triggered Facebook escapism.
2. *Self-Control:* Low self-control is a strong predictor of escapist and addictive use of SMP (Meier, Meltzer & Reinecke, 2018; Błachnio & Przepiorka, 2016).
3. *Loneliness:* Previous studies have shown that Facebook use can serve as compensatory means and decrease loneliness (Phu & Gow 2019; Meier, Meltzer & Reinecke, 2018).
4. *Life-Satisfaction:* Extant research shows that addictive and escapist Facebook usage is negatively related to life satisfaction (Blachnio, Przepiorka & Pantic, 2016; Meier, Reinecke & Meltzer, 2018).
5. *Usability:* PNs can tear users out of their activities if they are easy to comprehend, perceived as relevant, and useful (Fahlmann, Mejtolf & Cripps, 2018).

Triggered Facebook escapism was measured with six items that were developed in close reference to existing operationalizations (e.g. Katz et al., 1973; Meier et al., 2016; Papacharissi & Mendelson, 2011): forgetting worries and problems of everyday life, escaping from reality, distraction and mood management such as relaxation and unwind. The duration of the triggered visit was measured as being 0 – 10, 10 – 20, and 20 – 30 minutes.

Based on media entertainment theory the following variables were identified and operationalized as outcomes of triggered Facebook escapism: Feeling of guilt, feeling of enjoyment, eudaimonic need satisfaction, autonomy, competence, and relatedness.

The independent and dependent variables and the hypothesized relationships among them are summarized in the research and hypotheses model depicted in Figure 1.

Figure 1 – Research and Hypotheses Model



Method:

Data Collection and Sample: Data was collected by using a standardized online-survey. Structural equation modeling was used for the analysis of the data obtained.

442 undergraduate and graduate students of a major US university participated in the survey as part of a research lab-seminar (respondent rate = 100%). Within the overall sample, women are slightly overrepresented (54%). Participants were between 18 and 35 years old. Only 3% of participants held a Master's or Doctoral degree, while undergraduate students represented 69% of those surveyed.

Measurement model: The complete measurement model comprised 11 latent constructs and 46 items. Before testing the structural model, the measurement model was exploited as suggested by Gerbing & Anderson (1988). A confirmatory factor analysis revealed that the Cronbach's alpha values ranged from to 0.726 to 0.976, exceeding the recommended 0.7 threshold (Blanz, 2015) and indicating acceptable internal and composite reliability. Assessing convergent and discriminant validity provided acceptable evidence for construct validity (Fornell & Larcker, 1981). CR values ranged from 0.752 to 0.972, exceeding the recommended 0.7 threshold (Raykov, 1997) and indicating good construct reliability (Gefen & Straub, 2005). AVE values for all scales exceeded the recommend threshold of 0.5 (Hair et al., 1998) and indicate acceptable convergent validity. The Fornell-Larcker-Criterion fulfills the necessary requirements (Netemeyer et al., 2003) and shows the discriminant validity of the model (Fornell & Larcker, 1981).

Results:

The overall model shows strong confirmation for most of the hypotheses as ten of thirteen hypothesized and estimated paths are significant ($p \leq 0.05$) (see Table 1). Usability has the strongest effect on PN and triggered Facebook escapism ($\beta=0.29$, $p < 0.001$), followed by self-control ($\beta =-0.19$, $p < 0.01$). Thus, users are more likely to respond to PN when the usability of the notification is high, and their self-control is low. There is no significant direct impact from the remaining three independent variables.

Table 1 – Parameter Estimates and Hypothesis Testing

Relationship	**Std. Estimate (t-value)**	**Result**
H1. Need for cognition is negatively related to PN	0.018 (0.300)	not supported
H3. Loneliness is positively related to PN and triggered Escapism	0.070 (0.831)	not supported
H4. Life satisfaction is negatively related to PN and Triggered Escapism	-0.002 (-0.020)	not supported
H5. Usability is positively related to PN and Triggered Escapism	0.288 (3.818)***	supported
H6. Triggered Escapism is negatively related to Feeling of Guilt	-0.457 (-9.704)***	supported
H7. Triggered Escapism is positively related to Enjoyment	0.266 (4.414)***	supported
H8. Triggered Escapism is positively related to Autonomy	0.237 (2.993)**	supported
H9. Triggered Escapism is positively related to Competence	0.345 (5.328)***	supported
H10. Triggered Escapism is positively related to Relatedness	0.393 (7.014)***	supported
H11. Triggered Escapism is positively related to Duration of Stay (0-10 min.)	-0.314 (-5.687)***	supported
H12. Triggered Escapism is positively related to Duration of Stay (10-20 min.)	0.259 (4.356)***	supported
H13. Triggered Escapism is positively related to Duration of Stay (20-30 min.)	0.125 (2.233)*	supported

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Regarding the effects of triggered Facebook escapism on user experience, the results show that all relationships are (highly) significant (see Table 1). This confirms the results of existing research (i.e., Shi et al. (2010) or Langrial (2015). Moreover, triggered Facebook escapism is strongly negatively linked to the feeling of guilt (β=-0.46, $p<0.001$). Thus, PNs are able to implement positive entertainment feelings without causing a negative feeling afterwards.

Another interesting finding for the impact of triggered Facebook escapism is that a shorter time of stay (0–10 minutes) is strongly negatively linked (β=-0.31, $p<0.001$) in contrast to a longer duration of stay such as 10–20 minutes (β=0.26, $p<0.001$) and 20–30 minutes (β=0.12, $p<0.05$).

Overall, it can be stated that the higher the usability of PNs and the lower the self-control of users, the more positive experiences they have and the longer they are involved on Facebook.

With the above results, the study presented in the paper provides the following scientific contributions:

- Assessment of the predictors and implications of Facebook PN as triggers of habit-forming loops
- Introduction of triggered escapism

The results also allow the deduction of concrete guidelines for PN design in practice.

Future Work:

Based on the achieved results a second study was initiated by extending the exploration to other social media than Facebook: TikTok, Instagram and Twitter.

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