



Internet use during COVID-19 lockdown among young people in low- and middle-income countries: Role of psychological wellbeing

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ABSTRACT

Problematic internet use in adolescents has been shown to significantly increase over the past few years, with COVID-19 pandemic lockdowns reinforcing this phenomena globally. We sought to explore whether problematic internet use in specific countries was related to emotional well-being and importantly whether this is predicted by psychological distress. There is a growing number of studies showing that problematic internet use is increasingly prevalent in countries with emerging economies, however we have yet to find out to what extent other factors are influencing this behaviour in adolescents and young people. This study invited young people from countries such as India, Mexico, Philippines and Turkey to complete a set of self-reports on their daily internet habits, social media use, alongside questions on psychological distress, self-esteem, loneliness and escapism. A total of 1182 young people aged between 16 and 25 years old completed these questionnaires online. The results showed that there were significant difference in problematic internet use scores among adolescents in the Philippines and Turkey. More specifically, social media use was significantly higher amongst young people from the Philippines whereas gaming addiction was significantly high in the Turkish sample. These findings also revealed that psychological distress, loneliness, and low self-esteem consistently predicted problematic internet use. Taken together these results emphasise that there are several factors underlying growing figures of problematic internet use in young people, these factors include emotional distress, need for escapism, loneliness, and social media use, however, going forward more nuanced cultural differences should also be considered.

1. Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) also referred to as COVID-19 has led to complete or partial lockdowns in several countries globally. As a result of this movement restriction, young people now usually spend almost all their time at home. Most of the activities such as connecting with friends, accessing information (Guessoum et al., 2020), entertainment, and assessing school assignments and lessons were done online. These activities have led to high use of the internet; research shows that children and young people continue to partake in problematic internet use as means of coping with the enforced sedentary norms (Király et al., 2020).

Prior to the enforced COVID-19 related lockdowns, studies were emerging that highlighted internet addiction as a growing phenomenon, whilst emphasising the underlying cultural variations (Lopez-Fernandez, 2021). More importantly, Lopez-Fernandez (2021) argues that problematic internet use is widespread across all domains and platforms (e.g., on smartphones and gaming devices) in most countries. Recent studies in India (Prakash & Singh Yadav, 2020; Prakash, Yadav, & Singh, 2020), Taiwan (Lin, 2020), Indonesia (Siste et al., 2020), and Mexico (Priego-Parra et al., 2020) have shown that lockdown measures have led to an increase in problematic internet use amongst young people. Research however has yet to directly compare the impact of internet use in countries with emerging economies. The current study will therefore

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aim to compare problematic internet use scores among young people in four low- and middle-income countries (i.e., India, Mexico, the Philippines, Turkey). Conveniently selected countries were included as representative of different regions of the world.

Alongside growing problematic internet use is the concern of its link to mental health. Priego-Parra et al. (2020) report that during lockdown there was a significant increase in anxiety and depression. These mental health problems have then been linked to problematic internet use in adolescents in several countries (Fernandes, Nanda Biswas, Tan-Mansukhani, Vallejo, & Essau, 2020; Lin, 2020). Moreover, studies also report that escapism and loneliness is strongly associated with problematic internet use and further predicts internet addiction; which then leads to low self-esteem (Mamun et al., 2020; Ostovar et al., 2016; Tian, Qin, Cao, & Gao, 2020). For example in a Turkish sample, problematic social media use (e.g., increased use of Instagram) was strongly associated with escapism (Kircaburun & Griffiths, 2019), escapism however was linked to increased engagement with the social media platform particularly as a measure to cope with loneliness. Tian et al. (2020) argue that internet use on social media platforms such as Instagram provide compensation for face-to-face communication, this is often as a result of low self-esteem. Similarly online gamers with negative life outcomes (i.e., loss of jobs and relationships as a result of gaming) sought escapism as a result of low self-esteem and high levels of stress (Kardefelt-Winther, 2014). What remains unclear however is to what extent then escapism alongside poor mental health including psychological distress is linked to problematic internet use in Low- and middle-income countries (LMIC). Therefore, the overall aim of the present study was to examine the extent to which factors such as escapism, self-esteem, loneliness, psychological distress, escapism, gaming addiction, and social media use could predict problematic internet use in countries such as India, Mexico, Philippines and Turkey. Previous studies have shown high internet use amongst these countries (Fernandes, Aydin, Uzun, Tan-Mansukhani, & Biswas, 2021; Nayak, 2018); and even though these countries are categorised as collectivistic cultures which emphasises group connectedness (Triandis, 1995), it is not fully understood if factors that predict their problematic internet use differ. Based on earlier studies, we expect psychological distress, low self-esteem and loneliness in particular to be a significant predictor of problematic internet use.

2. Material and methods

2.1. Participants

A total of 1182 individuals (303 from India, 210 from Mexico, 439 from the Philippines and 230 from Turkey), with a mean age of 20.52 ($SD = 2.57$) completed the online survey shared via social medial platforms, youth groups and university/school network. Of these, 239 completed some of the survey questions before discontinuing. This resulted in a final sample of 943 young people with sufficient data (80 % complete) to include in the analysis. Further demographic information can be seen in Table 1. Most of the participants were college and university students.

2.2. Measures

Online and Smartphone App Usage Scale (Fernandes et al., 2020) was used to measure the overall frequency of online and smartphone app use. These apps were grouped in categories of streaming services (e.g., Netflix, Amazon Prime), shopping apps (e.g., Wish, Amazon), social media apps (e.g., Instagram, Snapchat, Twitter), gaming (e.g., Minecraft, Nintendo) and well-being (e.g., Headspace, MyFitnessPal). Participants were also asked to indicate the number of hours they spend on these app before and during the Covid-19 outbreak.

2.2.1. The Compulsive Internet Use Scale (CIUS) (Meerkerk, Van Den Eijnden, Vermulst, & Garretsen, 2009) was used to assess problematic internet use

This scale is made up of 14 items with a 5-point Likert scale (ranging from 0 = ‘never’, to 4 = ‘very often’). Similar to the initial study by Meerkerk et al. (2009), results from reliability analysis show good Cronbach’s alpha ($\alpha = 0.88$) for this measure in the present study.

2.2.2. Kessler Psychological Distress scale (K10; Kessler et al., 2002) was used to measure psychological distress

It consists of 10 items which can be rated on a 5-point Likert scale (ranging from 1 = ‘a little of the time’, to 5 = ‘all of the time’). In the original study, Kessler et al. (200) reported Cronbach’s alpha of 0.93, likewise good reliability was found in this study for this scale ($\alpha = 0.92$).

2.2.3. Social Media Use Questionnaire (SMUQ; Xanidis & Brignell, 2015) was used to measure use of social media

It has 9 items which can be rated on a 5-point Likert scale, ranging

Table 1
Demographic information of the participants across countries.

		N	%	India N (%)	Mexico N (%)	Philippines N (%)	Turkey N (%)
Gender	Female	943	79.7	263 (86.8)	154 (73.3)	329 (74.9)	197 (85.7)
	Male	239	20.3	40 (13.2)	56 (26.7)	110 (25.1)	33 (14.3)
Employment	Student	982	83.07	273 (27.8)	169 (17.2)	373 (38)	166 (16.9)
	In employment	174	14.7	28 (16.09)	30 (17.2)	60 (34.49)	56 (32.18)
	Other	26	2.2	2 (7.69)	11 (42.3)	6 (23.07)	7 (26.9)
Religion	Buddhist	11	0.9	7 (63.6)	0	4 (36.3)	0
	Christian	510	42.9	15 (2.94)	102 (20)	390 (76.4)	3 (0.5)
	Hindu	203	17	203 (100)	0	0	0
	Jewish	1	0.1	0	0	0	1 (100)
	Muslim	245	20.7	37 (15.1)	0	2 (0.8)	206 (84)
	Sikh	3	0.3	3 (100)	0	0	0
	Other	61	5.2	18 (29.5)	30 (49.1)	13 (21.3)	0
	No religion	148	12.8	20 (13.5)	78 (52.7)	30 (20.27)	20 (13.5)
Education	High school	592	50.08	114 (19.25)	94 (15.87)	252 (42.5)	132 (22.2)
	College	246	20.81	91 (37)	46 (18.7)	109 (44.3)	0
	University	287	24.28	88 (30.6)	55 (19.1)	46 (16.02)	98 (34.1)
	Prefer not to say	26	2.19	4 (15.3)	3 (11.5)	19 (73.07)	0
	Other	31	2.62	5 (16.1)	12 (38.7)	14 (45.1)	0

from 0 = 'never' to 5 = 'always'. The internal reliability of SMUQ initially was found to be 0.83 (Xanidis & Brignell, 2016), similarly in this study it was good ($\alpha = 0.86$).

2.2.4. Escapism Scale (Gao et al., 2017) was used to measure escapism from the real-world using internet services or apps on individual devices

It consists of four items which can be rated on a 4-point Likert scale (ranging from 1 = 'Strongly disagree, to 4 = 'Strongly agree'). Good internal reliability was found in this study for this scale ($\alpha = 0.92$).

2.2.5. A short-form UCLA Loneliness scale (ULS-8) was used to assess loneliness

It contains the 8 items from the revised UCLA Loneliness Scale (Hays & DiMatteo, 1987) which can be rated on a 4-point Likert scale, ranging from 1 = 'never' to 4 = 'always'. The Cronbach's alpha in the original study was 0.84, in this study the alpha was 0.67.

2.2.6. A 7-item Game Addiction Scale (GAS; Lemmens, Valkenburg, & Peter, 2009) was used to measure problematic gaming use

This scale has 7 items and is based on a 5-point Likert scale (ranging from 0 = 'never', to 5 = 'often'). The initial report by Lemmens et al. (2009) found reliability ranging from 0.81 to 0.86. The Cronbach's alpha in this study was 0.90.

2.2.7. A short version of the Rosenberg Self-esteem Scale (RSE; Rosenberg, 1965) was used to measure self-esteem

The 3 items were extracted from the original Rosenberg Self-Esteem Scale (Fernandes et al., 2021). This scale is set on a 4-point scale ranging from 1 = 'strongly disagree' to 4 = 'strongly agree'. In the present study, the Cronbach's Alpha for this measure was 0.83.

2.3. Procedure

The questionnaire was published online in Qualtrics, a platform which allows participants to complete the questionnaire online using an anonymous link. Participants in India and Philippines completed the questionnaire in English, whereas participants in Turkey completed the Turkish version of the questionnaires, and those in Mexico completed the Spanish translations of the questionnaire. These were translated by the researchers from these countries, in accordance with the back translation guidelines that are widely accepted for the successful translation of instruments in cross-cultural research (Brislin, 1970; Heppner, Wampold, & Kivlighan, 2008) and psychometric properties of the scales in Turkish and Spanish were considered. Participants were recruited online and the link to complete the questionnaire was shared on various social media networks and student groups (e.g., Twitter, Facebook) by each of the co-author in their respective country. All the participants voluntarily consented to completing the questionnaire, they were aware that their participation was completely anonymous as no personally identifying information was collected.

2.4. Statistical analysis

Preliminary analyses were conducted to see the univariate and multivariate normality of the sample for each country. The skewness and kurtosis coefficients were used to examine the distribution of Escapism, self-esteem, loneliness, gaming addiction, psychological distress, compulsive internet use, social media use scores. The coefficients calculated for the scores obtained from the questionnaires ($-0.85.8 \leq$ Skewness ≤ 0.95 , $-0.89 \leq$ Kurtosis ≤ 1.58) were within the specified range. Prior to conducting a hierarchical multiple regression, the relevant assumptions of this statistical analysis were tested. An examination of the Mahalanobis distance scores indicated no multivariate outliers. Data were analyzed using SPSS 25.0.

3. Results

In the first instance a series of one-way ANOVA's was carried out to determine differences in countries for participants' scores of self-esteem, loneliness, psychological distress, compulsive internet use, social media use, time spent on specific apps (Table 2). Results show that these factors differed significantly by country.

Results revealed that young people from the Philippines had significantly higher scores on escapism than young people from India, Mexico and Turkey. Whereas self-esteem scores among participants from Turkey were found significantly higher than those from Mexico, India, and the Philippines. Turkish participants also had significantly higher scores on loneliness and CIUS than young people from India, Mexico and the Philippines. As for game addiction scores by country, results showed that scores of Filipino participants were significantly higher than participants in India, Mexico and Turkey participants. Psychological distress scores were significantly higher among participants in the Philippines than participants in India and Mexico. However, psychological distress scores of participants in Mexico is significantly higher than the scores of participants in Turkey. The compulsive internet use scores of young people in the Philippines was significantly higher than young people in India, Mexico and Turkish participants mean scores. Likewise, the social media use mean score of participants in Philippines is significantly higher than mean scores of India, Mexico and Turkey. The time spent on certain apps was also significantly high for participants in the Philippines than participants in India and Mexico. These results indicate that for participants in the Philippines scores of problematic internet use, social media use and general app usage is significantly higher compared to the other countries. Moreover, we also explored gender differences overall; the findings revealed that gender did not differ significantly for self-esteem, loneliness, psychological distress, compulsive internet use, social media use, and time spent on specific apps, however, for escapism and gaming addiction (Table 2), male participants had significantly higher scores on escapism and game addiction than female participants.

A hierarchical multiple regression was conducted to examine factors that predict problematic internet use (Table 3). For the sample from India in step one, self-esteem, loneliness and psychological distress contributed significantly to the regression model, $F(3, 295) = 17.68, p < .001$ and accounted for 14% of the variation in compulsive internet use. The second model shows, escapism, game addiction and social media use variables explained an additional 34 % of variation in compulsive internet use and this change in R^2 was significant, $F(6, 292) = 27.04, p < .001$. When all six independent variables were included in stage two of the regression model, self-esteem, psychological distress and game addiction were not significant predictors of compulsive internet use ($p > .05$). In the Filipino sample, self-esteem, loneliness and psychological distress contributed significantly to the regression model, $F(3, 435) = 28.02, p < .001$ and accounted for 10% of the variation in compulsive internet use. In the second model, escapism, game addiction and social media use explained an additional 13% of variation in compulsive internet use and this change in R^2 was significant, $F(6, 432) = 38.01, p < .001$. In stage two of the regression model, loneliness and escapism were not significant predictors of compulsive internet use ($p > .05$).

For participants in Mexico, in the first model, self-esteem, loneliness and psychological distress contributed significantly to the regression model, $F(3, 206) = 6.28, p < .001$ and accounted for 16% of the variation in compulsive internet use. At stage two, escapism, game addiction and social media use variables explained an additional 34% of variation in compulsive internet use and this change in R^2 was significant, $F(6, 203) = 8.35, p < .001$. However, loneliness was not a significant predictor of compulsive internet use ($p > .05$). Finally, for Turkey, self-esteem, loneliness, and psychological distress contributed significantly to the regression model, $F(3, 224) = 16.73, p < .001$ and accounted for 18 % of the variation in compulsive internet use. In the

Table 2
Means and standard deviations of all the study variables by gender and countries.

	Gender				Countries					
	Male	Female	F	η^2	India	Mexico	Philippines	Turkey	F	η^2
Escapism	10.16 (3.38)	9.18 (3.60)	10.44**	0.01	8.50 ^c (3.25)	9.13 ^c (3.37)	10.35 (3.32)	9.02 ^c (4.28)	9.05**	0.02
Self-esteem	9.38 (1.97)	9.36 (1.84)	0.50	0.00	8.50 ^c (3.25)	9.13 ^c (3.37)	10.35 (3.32)	9.02 ^c (4.28)	23.45**	0.06
Loneliness	13.76 (4.28)	14.47 (4.62)	0.17	0.00	9.13 ^{b, d} (1.76)	9.58 ^d (2.01)	8.85 ^{b, d} (1.79)	10.32 (1.65)	186.87**	0.32
Gaming addiction	16.67 (6.19)	11.26 (5.3)	159.79**	0.12	12.62 ^d (3.28)	12.01 ^d (4.39)	13.23 ^d (2.82)	20.73 (2.94)	8.37**	0.02
Psychological distress	26.06 (8.79)	26.57 (8.50)	1.04	0.00	11.64 ^c (5.59)	12.14 ^c (5.1)	14.01 (6.3)	10.51 ^{c, b} (5.47)	5.61**	0.01
CIUS	44.09 (11.51)	43.48 (11.9)	0.70	0.00	25.27 ^c (8.3)	24.69 ^{c, d} (8.07)	28.03 (7.97)	27.08 (10.16)	48.27**	0.11
SMU	22.23 (7.48)	21.73 (7.53)	0.02	0.00	41.55 ^c (10.3)	43.25 ^c (10.45)	49.22 (11.13)	36.21 ^{a, b, c} (11.16)	40.13**	0.09
Apps	9.74 (3.69)	9.3 (3.59)	0.81	0.01	20.71 ^c (7.08)	18.32 ^{a, c, d} (7.09)	25.17 (6.9)	20.34 ^c (7.35)	16.34**	0.04

Note. **p < .01, a: & India: p < .05, b: & Mexico: p < .05, c: & Philippines: p < .05, d: & Turkey: p < .05, CIUS = Compulsive Internet Use, SMU = Social Media Use, APPS = Time Spent on Certain Online Applications.

Table 3
Predictors of Compulsive Internet Use (CIUS) across countries.

Variables	India			Philippines			Mexico			Turkey		
	β	t	R ²	β	t	R ²	β	t	R ²	β	t	R ²
Step 1			0.14			0.10			0.16			0.18
Self-esteem	0.09	0.15*		0.10	1.36*		0.16	3.56*		0.04	0.49*	
Loneliness	0.15	2.62**		0.01	0.19*		0.01	0.25*		0.03	0.52*	
Psychological distress	0.31	5.22**		0.30	4.05**		0.40	8.41**		0.44	6.5**	
Step 2			0.34			0.13			0.34			0.68
Self-esteem	0.23	0.47		0.10	1.64*		0.12	3.11**		0.05	1.30	
Loneliness	0.06	1.20**		0.21	2.72		0.05	1.35		0.07	1.77**	
Psychological distress	0.10	1.85		0.18	2.46*		0.18	3.83**		0.06	1.16*	
Escapism	0.09	1.77*		0.19	2.74		0.05	1.16*		0.15	3.52***	
Game addiction	0.12	1.96		0.05	0.75*		0.04	0.97*		0.04	1.02*	
Social media use	0.48	8.69***		0.40	4.89***		0.46	10.2***		0.75	17.97***	

Note. *p < .05, **p < .01, ***p < .001

second model, escapism, game addiction and social media use variables explained an additional 68% of variation in compulsive internet use and this change in R² was significant, F(6, 221) = 81.43, p < .001. However, self-esteem was not a significant predictor of compulsive internet use (p > .05). Overall, this suggests that escapism, game addiction and social media use significantly influences the outcomes for problematic internet use.

4. Discussion

The outbreak of COVID-19 has had a tremendous effect on the different dimensions of life, including the psychological well-being of the population (Zandifar & Badrfam, 2020); especially among young people, through the manifestation of feelings such as stress, anxiety, and depression (Yao et al., 2020; Zhu et al., 2020). Furthermore, studies have shown that adolescents tend to spend a high proportion of their time online to manage feelings of loneliness, psychological distress, escapism and/or self-esteem; in most countries during the lockdown young people have had to participate in online classes and thus online social mediums have been the only means for young people to remain connected with their peers (Király et al., 2020). To our knowledge, no study has compared the levels and predictors of problematic internet use among young people in low- and middle-income countries (i.e., India, Mexico, Philippines and Turkey). Additionally, we measured the impact of mental health on problematic internet use in these populations. Our findings provide support to recent studies (Ellis, Dumas, & Forbes, 2020; Lin, 2020), whereby problematic internet use was found to be significantly associated with psychological distress and escapism. Even before the pandemic, escapism has been linked with internet addiction, especially as escapism allows individuals to seek comfort online (Chen & Nath, 2016). For example, an aspect of internet addiction is problematic binge watching linked to loss of control, however an incentive of this is also considered to be escapism, in this case, it is a maladaptive form of coping to manage emotional problems (Flayelle et al., 2020). Our study

further found that loneliness, self-esteem and psychological distress predicted problematic internet use in all the four countries. These results suggests that alongside maladaptive escapism, poor mental health is a predictor of problematic internet use and further supports the claim that problematic internet use or gaming may be a coping strategy (Karddefelt-Winther, 2014).

In line with previous studies (Baloğlu, Şahin, & Arpacı, 2020; Su, Han, Yu, Wu, & Potenza, 2020), we found no significant gender differences for most of the variables, except for gaming addiction and escapism where males had significantly higher scores than females, regardless of country of residence. Focusing on gender, in their review of different countries including India and Turkey, Su et al. (2020) found prevalence of internet gaming disorder to be significantly higher in males than females. Su and colleagues suggest that this could be directly related to outcomes in the game itself, which could be linked to cultural norms of perceived masculine ideals. Research nonetheless, also shows that males often tend to have a higher financial allowance, with parents who may not limit internet usage from an early age and further have associated emotional problems, who in turn might be prone to developing problematic internet use (Chen, Wang, Lin, & Yang, 2020).

The results from this study also showed that participants from the Philippines, scored highly on scores of pathological internet use, social media use, gaming addiction, psychological distress, and escapism. The reason for this finding is unclear, however, it is worth noting that the participants from the Philippines had the lowest scores of self-esteem. Indian and Mexican participants reported similar scores of problematic internet use, gaming addiction, psychological distress, self-esteem, loneliness and escapism. Contrary to the other countries, Turkish participants had the lowest scores on problematic internet use and gaming addiction, and that they had high self-esteem scores. However, Turkish participants also reported highest scores of loneliness. These findings could be related to cultural differences, for example, Chia et al. (2020) found that internet use and internet addiction was high in South East Asian countries, suggesting that their lack of individualistic nature

motivates individuals to seek networks online and build their social relationships online. This motivation is then linked to loss of control with online behaviours, with reliance on the internet as a way to cope with stress and poor psychological well-being (Kuss, Kristensen, & Lopez-Fernandez, 2021). This has been further highlighted in studies showing the negative impact of problematic internet use during the COVID-19 pandemic lockdown in countries such as the Philippines and India (Subudhi & Palai, 2020; Tee et al., 2020). This high level of problematic use of internet has also been reported in India (Anand et al., 2018; Vadher et al., 2019), Philippines (Mak et al., 2014) and Turkey (Kirik, Arslan, Çetinkaya, & Gül, 2015) prior to the lockdowns associated with the COVID-19 pandemic, suggesting that perhaps the increase in problematic internet use may be a growing concern for LMIC even before the pandemic (Anand et al., 2018; Fernandes et al., 2020; Kirik et al., 2015). Moreover, a study conducted in the western parts of India just before the outbreak of the pandemic examining the relationship between internet overuse loneliness and addictive symptoms report a significant positive correlation with loneliness and symptoms of withdrawal, alongside functional and social impairments (Shah, 2020).

Our study has several methodological limitations which need to be considered when interpreting our findings. Firstly, the cross-cultural aspect of this study limits inference of more specific influences from each country (i.e., cultural norms). This could provide a further explanation for differences in problematic internet use within each country. Secondly, the individuals completing these questionnaires were largely university students or in school, often from affluent backgrounds with access to the internet. These factors may affect generalisability towards the larger populations within these countries. Finally, the conditions under which these questionnaires were completed are unknown as they were published online for participants to complete when they could, this may have further excluded young people without internet access from completing the surveys.

4.1. Conclusions

This study was the first to have compared the prevalence of problematic internet use among young people in India, Mexico, Philippines and Turkey during the COVID-19 pandemic, and the role of internet use on psychological well-being. Our finding highlights that problematic internet use was significantly predicted by psychological distress, loneliness, low self-esteem and escapism. The study also revealed significant differences in internet use in between countries, however these results should be interpreted with caution, with further studies needed to explore the specific influences of culture. Nonetheless, this study highlights the impact of poor psychological well-being on problematic internet use regardless of country of residence.

CRedit authorship contribution statement

Blossom Fernandes: Conceptualization, Validation, Project administration, Writing – original draft, Writing – review & editing. **Bilge Uzun:** Formal analysis, Writing – review & editing. **Caner Aydin:** Formal analysis, Writing – review & editing. **Roseann Tan-Mansukhani:** Data curation, Writing – review & editing. **Alma Vallejo:** Data curation, Writing – review & editing. **Ashley Saldaña-Gutierrez:** Data curation, Writing – review & editing. **Urmi Nanda Biswas:** Data curation, Writing – review & editing. **Cecilia A. Essau:** Conceptualization, Validation, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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