The Effects of Cognitive Training and Compassion Intervention on Impaired Control over Gaming

Yugan SO [1*], Kana KOBAYASHI [1], Yasushi FUJII [1,2]

1 Department of Psychology, Meisei University, Japan 2 Department of Behavioral Medicine, National Institute of Mental Health, National Center of Neurology and Psychiatry, Kodaira, Japan

Introduction

There have been many interventions for Gaming disorder. But one of the problems is people have gaming disorder have poor motivation. Therefore, So et al.(2024) showed that cognitive training is effective for impaired control of gaming disorder. But people who have high emotion regulation difficulties have a low effect. This study aims to intervene in high impaired control and emotion regulation difficulties.

Methods

Participants

-10 university students
-21.17 ± 1.62years
-High impaired control
-High emotion regulation difficulties
-No medication

Procedure

Cognitive Training
-**GNGT** (adapted from the **Go/NoGo task**)(5 min)
-**DPT** (adapted from the **dot-probe task**)(5 min)
-**SST** (adapted from the **stop-signal task**)(5 min)
➡15 min/session, 3 times/week, for 4 weeks

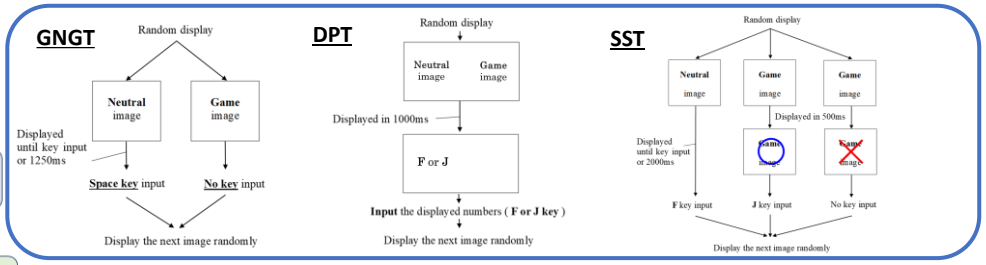
Compassion Intervention
-**Psychoeducation**
➡ (One 40-min session)
-**Homework**
➡ (10 min/day, for 4 weeks)

Procedure Flow

T1 Measurement
4weeks
T2 Measurement / Psychoeducation
4weeks
T3 Measurement
4weeks
T4 Measurement

Cognitive training

Compassion homework



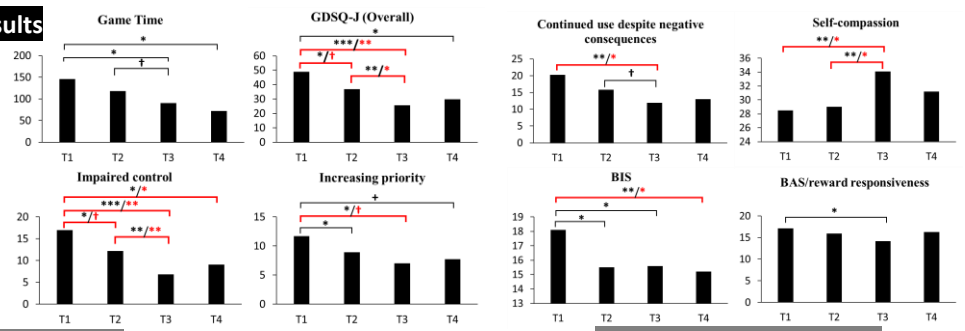
Psychoeducational Content (One 40-min)
- Behavioral Addictions as Emotional Regulation
- Three Emotional Systems
- Drawbacks of Overactive Red and Blue Systems
- Importance of Enhancing the Green System
- Behavioral Changes through Three Emotional Systems
- Compassionate Behavior
- Four Elements of Compassion

Home Work Content (10min/day)
- **Breathing Techniques** (5 min)
  - Palm-Turning Breathing
  - Mindful Breathing
  - Soothing Breath
- **Compassion Exercises** (5 min)
  - Compassionate Color
  - Compassionate Coach
  - Loving-Kindness Meditation
  - Compassionate Body Scan
- (**Functional Analysis (as possible)**)

Measurement

-Gaming disorder symptom（GDSQ-J）(So et al, 2024)
-Game time (self-report)
-Emotion regulation difficulties (Yamada & Sugie, 2013)
-Coping（TAC-24；Kamimura et al, 1995）
-Self-compassion（Arimitsu et al, 2016）
-Compassion（Asano, 2020）
-Impulsive（BIS/BAS） (Iide & Daibo, 2005)

Results



ANOVA

(one-way repeated measures)

	F-value	*ES* (η^2)
Game time	4.11 *	0.14
GDSQ-J (Overall)	6.31 *	0.18
Impaired control	9.90 ***	0.29
Increasing priority	3.05 *	0.07
Problem persistence	2.81 †	0.13
Self-compassion	2.77 †	0.09
BIS	4.55 *	0.13
BAS/reward responsiveness	2.81 †	0.07

$^{***}p<.001$, $^{**}p<.01$, $^{*}p<.05$, $^{\dagger}p<.10$

Effect Size (*d*)

	T1-T2		T1-T3		T1-T4	
	ES(d)	*95%CI*	*ES(d)*	*95%CI*	*ES(d)*	*95%CI*
Game time	**0.39**	[-0.18, 0.96]	**0.80**	[0.11, 1.50]	**1.04**	[0.11, 1.98]
GDSQ-J (Overall)	**0.75**	[0.10, 1.41]	**1.46**	[0.66, 2.26]	**0.83**	[-0.04, 1.71]
Impaired control	**0.94**	[0.07, 1.80]	**1.78**	[0.75, 2.81]	**1.05**	[0.18, 1.91]
Increasing priority	**0.39**	[0.02, 0.76]	**0.89**	[0.22, 1.56]	**0.52**	[-0.09, 1.13]
Problem persistence	**0.56**	[-0.23, 1.35]	**1.24**	[0.29, 2.18]	**0.76**	[-0.29, 1.80]
Self-compassion	**0.06**	[-0.32, 0.45]	**0.66**	[0.22, 1.09]	**0.41**	[-0.48, 1.30]
BIS	**0.83**	[-0.03, 1.69]	**0.78**	[-0.00, 1.57]	**1.06**	[0.40, 1.72]
BAS/reward responsiveness	**0.35**	[-0.21, 0.93]	**0.67**	[0.05, 1.28]	**0.17**	[-0.33, 0.67]

Note: *ES*=Effect Size, *d*=Cohen's *d*

Multiple Regression Analysis

(Target variable：impaired control)

	Estimate	95%*CI*	VIF
Lack of emotional clarlity	.243	[-0.11 , 0.60]	1.615
Self-compassion	-.587 *	[-0.96 , -0.22]	1.761
compassion(for self)	-.549 *	[-1.02 , -0.08]	2.856
compassion(for other)	-.173	[-0.50 , 0.15]	1.360
Self-control	.196	[-0.23 , 0.62]	2.304
BIS	.093	[-0.30 , 0.49]	1.988
R^2	.977		
Adjusted R^2	.930		

$^{*}p<.05$

Conclusions

Interpretation of Findings

Reduced impaired control –
Cognitive training plus compassion strategies led to notable decreases in gaming control difficulties.

Role of self-compassion –
Improvements in self-compassion appeared to mediate reductions in impaired control.

Stepwise intervention –
Sequential use of cognitive then compassion training enhanced and maintained effects.

Theoretical and Clinical Implications

Alternative to CBT –
May benefit individuals less responsive to standard CBT approaches.

Preventive potential –
Suitable for early intervention in university student populations.

Interoceptive awareness –
Increased interoceptive awareness may have contributed to better emotional regulation and gaming control.

Methodological Limitations

Sample and design –
Small sample size (N=10) and no control group limit generalizability.

Self-report only –
Outcomes were based solely on questionnaires, without behavioral data.

Short-term follow-up –
Effects beyond one month are not yet known.

Conflict of Interest: The authors declare that there are no conflicts of interest related to this study.

E-mail: 19dp002@stu.meisei-u.ac.jp