How was local game history made?

Akito INOUE (Ritsumeikan University)
Kazufumi FUKUDA (Ritsumeikan University)
2017 August 21, Replaying Japan

Problem

What is “Japanese video game”

- Kohler, Chris. "*Power-up: how Japanese video games gave the world an extra life*." (2004).
- Picard, Martin. "*The foundation of geemu: A brief history of early Japanese video games*." Game Studies 13.2 (2013).
- Pelletier-Gagnon, Jérémie. *Video Games and Japaneseness: An analysis of localization and circulation of Japanese video games* in North America. Diss. McGill University, 2011.

What is “Japanese video game”

- Some famous “Made in Japan” games is not famous in Japan.

  Ex : “*Zaxxon*”(1982), “*Jet Grind Radio*” (2000), “*Cooking Mama*”(2006)

(C)SEGA 1982

(C)SEGA 2000

(C)TAITO 2006

Some famous Japanese game is not famous in English context.

Ex : “moon”(1997)

(C) ASCII 1997

(C) ASCII 1997

Japanese gamer don’t know famous US/EU game titles.

- For example, most of Japanese video game players don’t know

  Ex : “*Tempest*”(1981), “*Canabalt*”(2009)

(C)ATARI 1981

(C)Semi-Secret Software 2009

Purpose of the study

Japanese video game context and English video game context, each context have much local bias. We want to know local game history biases.

Context in social science

Context A: Nationalism Studies

Hobsbawm, E., & Ranger, T. (Eds.). (2012). *The invention of tradition*. Cambridge University Press.

Oguma, E. (2002). *A genealogy of'Japanese'self-images*. ISBS.

Context B: Cultural Reproduction

Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste*. Harvard University Press.

Context C: Multiple equilibria

Aoki, M. (1988). *Information, incentives and bargaining in the Japanese economy: a microtheory of the Japanese Economy*. Cambridge University Press.

Etc..

Significance of the study

A) Making basic resource for local game history research, and area studies.

B) Extended use case trial of Media Art DB.

Now, This DB don't include work – version relation.(at 2017/8)

Media ART DB / Game Domain(Published by Agency for Cultural Affairs Japan)

Step of this research

	Main theme	Data Aggregation	Statistic Analysis	Making Valid Index
2015	Proof of the review's bias		△	
2016	The detail of local bias via review's bias	△	△	
2017	The structure of local bias via review's bias	△	○	
2018 ～	Making index of local bias via review's bias	○	○	○

Index review factors
Kalimo[2005],Mukai[2004],Naito[1988]

1. Comparability
2. Reliability, Robustness
3. Validity
4. Referring Bias
5. Perfectively

Kalimo, E. (2005). OECD Social Indicators for 2001: a critical appraisal. Social Indicators Research, 70(2), 185-229.)
向井信一 (2004). 「生活の質」 評価に関する一考察. 同志社政策科学研究, 6(1), 203-222.
内藤正明. (1988). " 環境指標" の歴史と今後の展開. 環境科学会誌, 1(2), 135-139.

Precedence studies

Game Review Method: Precedence Studies

[Physiological Evaluation]

Mandryk, R. L. (2008). Physiological measures for game evaluation. Game usability: Advice from the experts for advancing the player experience, 207-235.

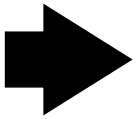
Nacke, L. E. (2015). Games user research and physiological game evaluation. In Game User Experience Evaluation (pp. 63-86). Springer International Publishing.

[Automatic Review Algorithm]

Nielsen, T. S., Barros, G. A., Togelius, J., & Nelson, M. J. (2015, April). General video game evaluation using relative algorithm performance profiles. In European Conference on the Applications of Evolutionary Computation (pp. 369-380). Springer International Publishing.

[Usability Evaluation]

Pinelle, D., Wong, N., & Stach, T. (2008, April). Heuristic evaluation for games: usability principles for video game design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1453-1462). ACM.



They were trying to make valid review method.
However I'd like to know review "bias" problems.

Metacritique's meta score

R = 0.55　p-value = under 0.05

Adams et al(2013)

On the Validity of Metacritic in Assessing Game Value
Adams Greenwood-Ericksen, Scott R. Poorman, Roy Papp
Eludamos. Journal for Computer Game Culture. 2013; 7 (1), pp. 101-127

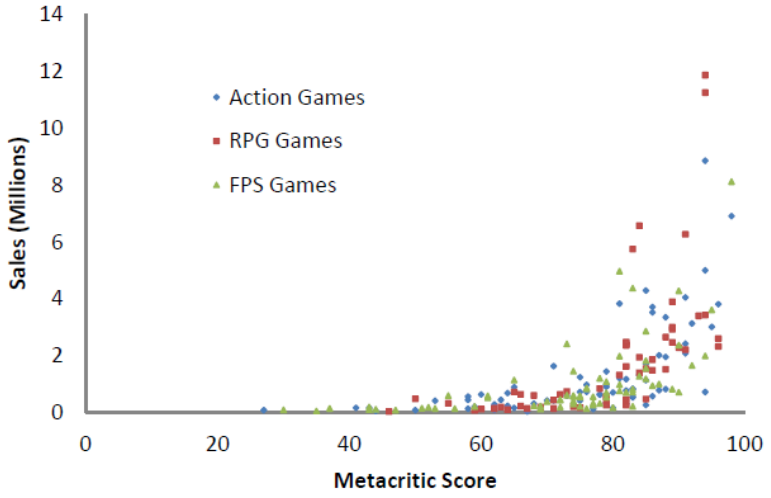
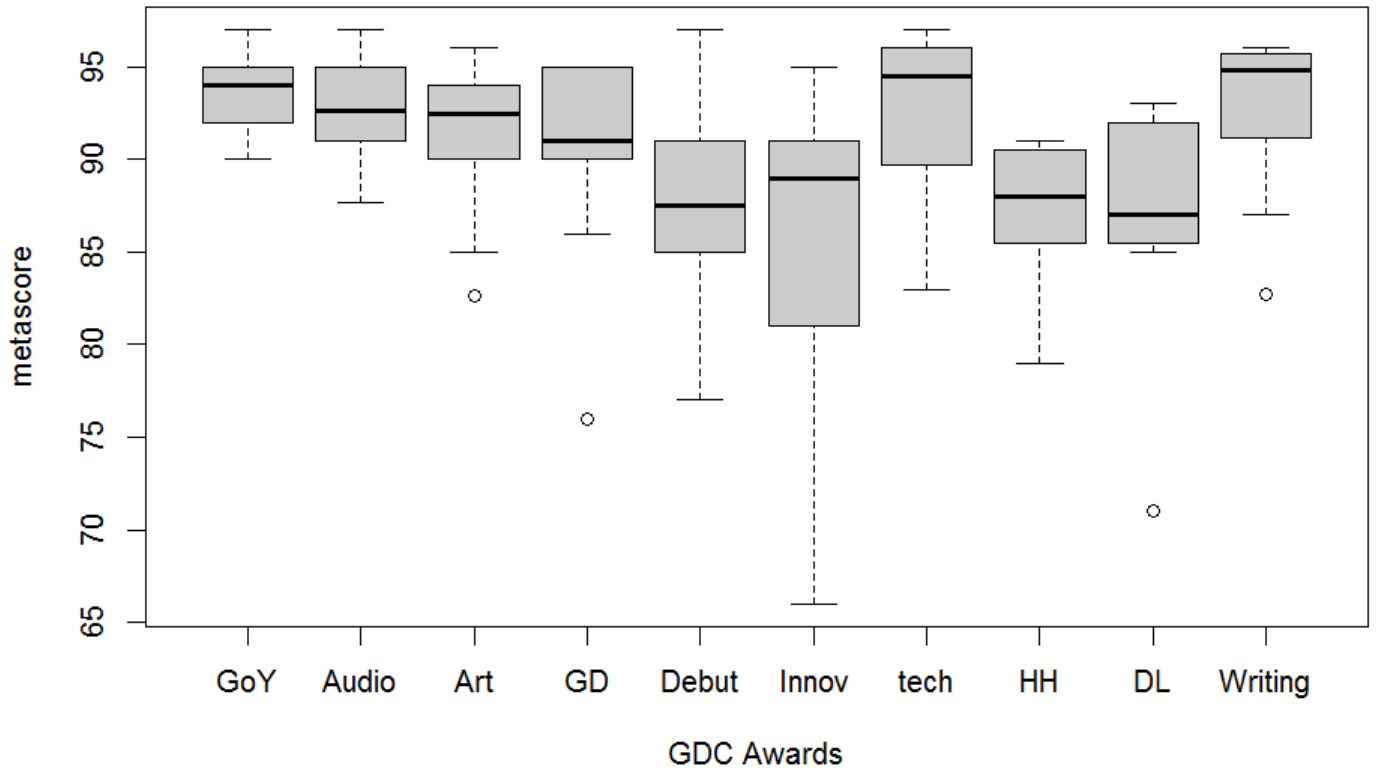


Figure 1. Metacritic Score versus Sales (in Millions) by Genre

BEN GIFFORD(2009=2013)
"REVIEWING THE CRITICS:EXAMINING POPULAR VIDEO GAME REVIEWS THROUGH A COMPARATIVE CONTENT ANALYSIS",Bachelor of Arts in Journalism ath the Cleveland State University, Cleveland, OH/MASTER OF APPLIED COMMUNICATION THEORY AND METHODOLOGY at the CLEVELAND STATE UNIVERSITY

Daisuke Yoshinaga(2015) : User's game review score is unstable. It have weakness against flaming.

Inoue(2015)
: Game Developer Choice Awards * Metascore



Metascore can’t review innovative factor.

Last year(2016) Findings

Japan context only / by genre

Genre	N	TITLE
RPG	12	Torneko no Daibōken: Fushigi no Dungeon, Ragnarok Online,Yokai watch, Shin Megami Tensei: Devil Summoner, Mystery Dungeon: Shiren the Wanderer, Romancing Saga 2, The Final Fantasy Legend, PoPoLoCrois Story, Romancing Saga, Yokai watch 2,moon, Bravely Default
ETC	10	Love Plus,idol m@ster,Ingress,#denkimeter, Colony-na-Seikatsu,Gunma-no-yabo, Osawari-Tantei Nameko-Saibai kit,Hatsune-Miku Project DIVA,Neko-atsume,Aquanaut's Holiday
ADV	9	Sakura Wars, Tsukihime, Higurashi When They Cry, Sound Novel Evolution 2: Kamaitachi No Yoru, Sound Novel Evolution 3: Machi – Unmei no Kousaten, D, 428: Fūsa Sareta Shibuya de,The Portopia Serial Murder Case, Boku no Natsuyasumi
SLG	6	Tokimeki Memorial, Kantai Collection, Densha de Go!, Derby Stallion, Gunparade March, Gihren no Yabou
ACT	5	Heiankyo Alien, Dynasty Warriors 3, MANEATER, Naruto: Ultimate Ninja Storm, Kidō Senshi Gundam: Senjō no Kizuna
SPO	4	Pro Yakyu Family Stadium, J-League Jikkyou Winning Eleven, Jikkyo Powerful Pro Yakyu ,Tennis for two
PZL	2	Gee Bee, Pazudora Z
Fighting	1	Art of Fighting
RACE	1	SEGA RALLY CHAMPIONSHIP

English context only / by genre

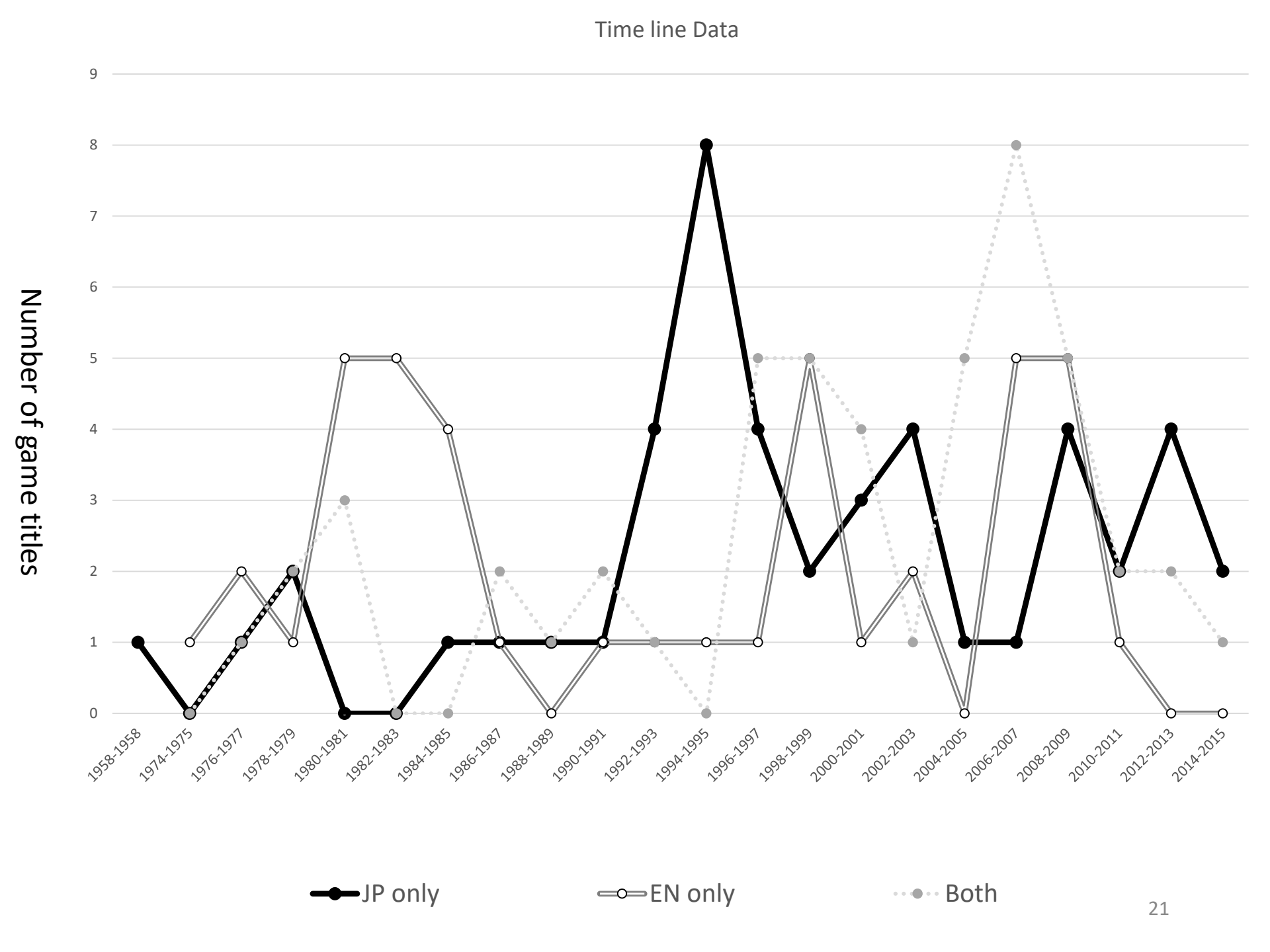
Genre	N	TITLE
ACT	13	Portal, Flower, Marble Madness, TRON: Maze-Atron,Jumpman, Tempest, Joust, Brütal Legend, Spy vs Spy, Earthworm Jim, Canabalt, Spy hunter, TANK
STG	12	Zaxxon,Star Trek: Strategic Operations Simulator, Defender, Centipede, Dead space, Geometry Wars: Retro Evolved 2, Einhänder, I Robot, Berzerk, Star Raiders, Attack of the Mutant Camels,1943: The Battle of Midway,
SLG, RTS	8	flOw, Pirates!, Worms Armageddon, Dwarf Fortress, Dune II: Battle for Arrakis, Utopia, Company of heroes, Lord of the Rings: Battle for Middle Earth II
ADV	5	Myst, The Secret of Monkey Island, Zork I, ADVENTURE, Grim Fandango
ETC	4	Vib-Ribbon, Passage, Majestic, TELSTAR
PZL	4	ChuChu Rocket!, Q*bert, Zack & Wiki: Quest for Barbaros' Treasure, Boom Blox
RPG	3	EVE Online, Ever Quest, Never winter Nights
SPO	1	Sensible World of Soccer

Famous in both Context / by genre
(around even point get)

Genre	N	TITLE
ACT	20	Super Mario 64, Metal Gear solid, Super Mario Brothers 3, Pac-man, Donkey Kong, Shadow of the Colossus , Resident Evil, Ōkami, Metal Gear Solid 4, Guns of the Patriot, Sonic the Hedgehog, New Super Mario Brothers Wii, New Super Mario Brothers, Katamari Damacy, Super Mario Galaxy, Grand Theft Auto V, RED DEAD REDEMPTION, Shenmue, Crazy Climber, Journey, Super Smash Bros. for Wii U
RPG	9	Final Fantasy VII, Pockemon(Red,Green),Final Fantasy IX, Dragon Warriors(Dragon Quest),Final Fantasy VIII, Final Fantasy XII, Final Fantasy X, Kingdom Herts, Pockemon(Gold, Silver)
ETC	5	Nintendogs, Wii Fit, Brain Age, Mine Craft, Animal Crossing
ACT・RPG	4	The Legend of Zelda, The Legend of Zelda : Ocarina of Time, The Legend of Zelda: A Link to the Past, The Legend of Zelda: Majora's Mask
RACE	3	Mario Kart Wii, Gran Turismo, Super Mario Kart
FPS	1	Call of Duty 4: Modern Warfare
SPO	2	Wii Sports, Wii Sports Resort
STG	2	Space Invader, Galaxian
ADV	1	HEAVY RAIN
PZL	1	Breakout
RTS	1	Pikmin

Publisher's bias

	JP only		EN only		Both	
	Publisher	N	Publisher	N	Publisher	N
1	BANDAI NAMCO /BANDAI/NAMCO	5	Atari	7	Nintendo	22
2	Chunsoft	4	Electronic Arts	2	SQUARE	5
3	KONAMI	4	Midway Games	2	SCE	4
4	SEGA	4	SCE	2	KONAMI	3
5	SUQARE / ENIX	4	Others	37	SEGA	3
6	SCE	3			Activision	2
7	Ascii	2			CAPCOM	2
8	LEVEL5	2			NAMCO	2
9	Others	22			RockstarGames	2
10					Others	5


Time line Data
Number of game titles
9
8
7
6
5
4
3
2
1
0
1958-1958
1974-1975
1976-1977
1978-1979
1980-1981
1982-1983
1984-1985
1986-1987
1988-1989
1990-1991
1992-1993
1994-1995
1996-1997
1998-1999
2000-2001
2002-2003
2004-2005
2006-2007
2008-2009
2010-2011
2012-2013
2014-2015
JP only
EN only
Both

Last year : findings(2016)

(1) We don’t know each other.

a. A lot of Japanese don’t know about 1980s famous titles in English contexts.

b. A lot of non-Japanese people don’t know middle of the 1990s in Japanese famous titles.

(2) A lot of ADV and RPG genre game is only famous in Japanese contexts

- Ex:*Higurashi,Sakura Wars,Toruneko no Daiboken*

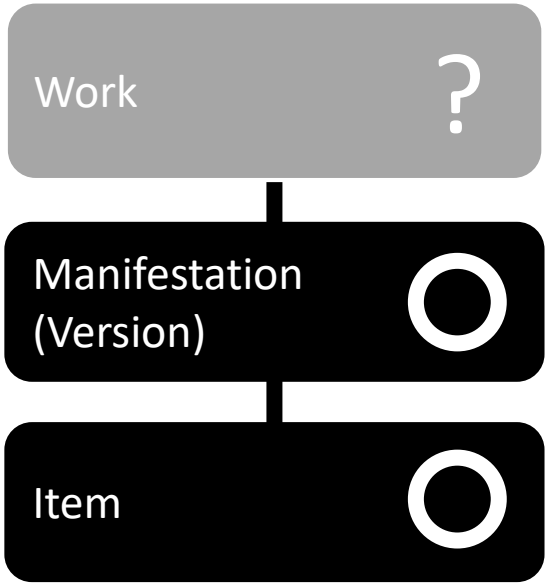
(3) A lot of ACT and STG genre game in 1970s-1980s English contexts is not famous in Japan.

- Ex:*Zaxxon,Tempest*

(4) In Both context, Nintendo games are very famous.

- Ex:*Mario,Zelda,Donkey Kong, Pocket monster*

Last Year:
“Further studies”



A) Next step : Making credible “work” level DB. Then, refining the data.
   - #this research “work” level credibility is far from perfect.

B) In a similar way, we can check more area game history,such as Korean,German, French... and so on.

C) Find correlation with other factors.

   More Statistical analysis.

Method

Method

1. Aggregate game title lists
   - Picking up game lists.
   - Making Categories
   - Aggregate lists
2. Statistical Analysis
   - Correlation coefficient
   - Multivariate analysis
     - ~~Principal component analysis(PCA)~~
     - Exploratory Factor Analysis(EFA) / simplimax
     - Structural Equation Modeling(SEM)

To aggregate lists

At first, Picking up video game titles from

a. video game books, awards, exhibitions about video games, and sales data.
b. If the same video game title was found from several resources, the video game title gets a high score.
c. Identifying “title” level, not “version(manifestation)” level.

Method : example

Title	Japanese Category 1		JP Category 1 Point	EN Category 2			EN Category 2 Point
	JP Awards A	JP Awards B		Book A	Museum A	Museum B	
Super Mario Bros		1	1			1	1
Wii Sports	1		1	1	1		2
Final Fantasy VII	1	1	2			1	1
Super mario 64	1		1			1	1
Wii Fit	1	1	2				0
Metal Gear Solid	1	1	2	1		1	2
Pokémon	1	1	2				0
The Legend of Zelda: Ocarina of Time	1		1			1	1
Super Mario Bros 3			0			1	1
nintendogs	1		1	1	1		2

Next,
Standardizing scores for each category

Categories

	Authorized	Non – Authorized Collective data
Contemporary	Awards	Sales data
Retrospective	Book of game history, Museum Exhibition	Game mania vote lists Ex : ”Top 100 games in history”

Making 8 Categories

Japan context

1. Contemporary – Collective : Sales Data
2. Contemporary – Authoritative : Awards
3. Retrospective – Collective : Fun Voting list
4. Retrospective – Authoritative : Historical book, Museum exhibition.

English context

5. Contemporary – Collective : Sales Data
6. Contemporary – Authoritative : Awards
7. Retrospective – Collective : Fun Voting list
8. Retrospective – Authoritative : Historical book, Museum exhibition.

Data list

- Ref : Excel data

Data

	2016	2017
Game titles	4800 titles	5700 titles
Game lists	48 lists	131 lists

- Problem: Name Identification

  Which English title and which Japanese title is same work ?(I spent 15 days for identify them)

  - ✓Some problem may be left, in this data.
  - ✓We need “Work” and “Version(Manifest)” relation database.

Result

- Simple Correlation coefficient

Correlation coefficient 1950-1985

1950-1985	Year	JP_Sales.DL	JP_con.Auth	JP_Past.Coll	JP_Past.Auth	EN_Sales.DL	EN_con.Auth	EN_Past.Coll	EN_Past.Auth	Average
Year	1.00	0.13	0.08	0.27	-0.11	0.05	0.05	0.06	0.01	0.09
JP_Sales.DL	0.13	1.00	0.41	0.20	0.09	0.32	-0.01	0.15	0.21	0.19
JP_con.Auth	0.08	0.41	1.00	0.21	0.11	0.46	0.00	0.24	0.28	0.22
JP_Retro.Coll	0.27	0.20	0.21	1.00	0.27	0.02	-0.04	0.28	0.22	0.19
JP_Retro.Auth	-0.11	0.09	0.11	0.27	1.00	0.05	-0.03	0.27	0.22	0.14
EN_Sales.DL	0.05	0.32	0.46	0.02	0.05	1.00	-0.01	0.19	0.28	0.17
EN_con.Auth	0.05	-0.01	0.00	-0.04	-0.03	-0.01	1.00	-0.01	-0.02	0.02
EN_Retro.Coll	0.06	0.15	0.24	0.28	0.27	0.19	-0.01	1.00	0.82	0.25
EN_Retro.Auth	0.01	0.21	0.28	0.22	0.22	0.28	-0.02	0.82	1.00	0.26

Correlation coefficient 1986-1990

1986-1990	Year	JP_Sales.DL	JP_con.Auth	JP_Past.Coll	JP_Past.Auth	EN_Sales.DL	EN_con.Auth	EN_Past.Coll	EN_Past.Auth	Average
Year	1.00	-0.11	-0.04	-0.15	-0.01	0.00	0.00	0.02	-0.03	0.04
JP_Sales.DL	-0.11	1.00	0.30	0.07	0.42	0.52	-0.02	0.21	0.23	0.24
JP_con.Auth	-0.04	0.30	1.00	0.15	0.39	0.07	-0.03	0.15	0.15	0.16
JP_Retro.Coll	-0.15	0.07	0.15	1.00	0.15	-0.03	-0.06	0.12	0.13	0.11
JP_Retro.Auth	-0.01	0.42	0.39	0.15	1.00	0.18	-0.03	0.30	0.30	0.22
EN_Sales.DL	0.00	0.52	0.07	-0.03	0.18	1.00	0.19	0.27	0.33	0.20
EN_con.Auth	0.00	-0.02	-0.03	-0.06	-0.03	0.19	1.00	-0.01	-0.02	0.04
EN_Retro.Coll	0.02	0.21	0.15	0.12	0.30	0.27	-0.01	1.00	0.81	0.24
EN_Retro.Auth	-0.03	0.23	0.15	0.13	0.30	0.33	-0.02	0.81	1.00	0.25

Correlation coefficient 1991-1995

1991-1995	Year	JP_Sales.DL	JP_con.Auth	JP_Past.Coll	JP_Past.Auth	EN_Sales.DL	EN_con.Auth	EN_Past.Coll	EN_Past.Auth	Average
Year	1.00	0.09	-0.06	-0.16	0.03	0.02	-0.01	-0.03	-0.04	0.05
JP_Sales.DL	0.09	1.00	0.09	-0.03	0.26	0.14	0.08	0.25	0.26	0.15
JP_con.Auth	-0.06	0.09	1.00	-0.01	0.17	0.01	-0.05	0.09	0.09	0.07
JP_Retro.Coll	-0.16	-0.03	-0.01	1.00	0.23	-0.08	0.01	0.04	0.03	0.07
JP_Retro.Auth	0.03	0.26	0.17	0.23	1.00	0.04	0.02	0.21	0.30	0.16
EN_Sales.DL	0.02	0.14	0.01	-0.08	0.04	1.00	0.22	0.32	0.38	0.15
EN_con.Auth	-0.01	0.08	-0.05	0.01	0.02	0.22	1.00	0.12	0.14	0.08
EN_Retro.Coll	-0.03	0.25	0.09	0.04	0.21	0.32	0.12	1.00	0.76	0.23
EN_Retro.Auth	-0.04	0.26	0.09	0.03	0.30	0.38	0.14	0.76	1.00	0.25

Correlation coefficient 1996-2000

1996-2000	Year	JP_Sales.DL	JP_con.Auth	JP_Past.Coll	JP_Past.Auth	EN_Sales.DL	EN_con.Auth	EN_Past.Coll	EN_Past.Auth	Average
Year	1.00	-0.01	-0.03	-0.19	-0.09	0.01	0.22	0.01	0.05	0.07
JP_Sales.DL	-0.01	1.00	0.35	-0.04	0.18	0.04	-0.03	0.15	0.06	0.11
JP_con.Auth	-0.03	0.35	1.00	0.21	0.38	0.17	0.17	0.31	0.28	0.24
JP_Retro.Coll	-0.19	-0.04	0.21	1.00	0.37	-0.07	-0.02	0.16	0.11	0.15
JP_Retro.Auth	-0.09	0.18	0.38	0.37	1.00	0.12	0.08	0.34	0.29	0.23
EN_Sales.DL	0.01	0.04	0.17	-0.07	0.12	1.00	0.13	0.23	0.23	0.12
EN_con.Auth	0.22	-0.03	0.17	-0.02	0.08	0.13	1.00	0.25	0.34	0.15
EN_Retro.Coll	0.01	0.15	0.31	0.16	0.34	0.23	0.25	1.00	0.78	0.28
EN_Retro.Auth	0.05	0.06	0.28	0.11	0.29	0.23	0.34	0.78	1.00	0.27

Correlation coefficient 2001-2005

2001-2005	Year	JP_Sales.DL	JP_con.Auth	JP_Past.Coll	JP_Past.Auth	EN_Sales.DL	EN_con.Auth	EN_Past.Coll	EN_Past.Auth	Average
Year	1.00	0.01	0.09	-0.03	-0.03	-0.04	0.02	0.00	-0.02	0.03
JP_Sales.DL	0.01	1.00	0.37	-0.09	0.07	0.00	-0.14	0.07	0.01	0.10
JP_con.Auth	0.09	0.37	1.00	0.08	0.33	0.06	0.07	0.28	0.23	0.19
JP_Retro.Coll	-0.03	-0.09	0.08	1.00	0.26	-0.04	0.06	0.17	0.17	0.11
JP_Retro.Auth	-0.03	0.07	0.33	0.26	1.00	0.05	0.10	0.21	0.19	0.16
EN_Sales.DL	-0.04	0.00	0.06	-0.04	0.05	1.00	0.22	0.25	0.27	0.12
EN_con.Auth	0.02	-0.14	0.07	0.06	0.10	0.22	1.00	0.30	0.31	0.15
EN_Retro.Coll	0.00	0.07	0.28	0.17	0.21	0.25	0.30	1.00	0.79	0.26
EN_Retro.Auth	-0.02	0.01	0.23	0.17	0.19	0.27	0.31	0.79	1.00	0.25

Correlation coefficient 2006-2010

2006-2010	Year	JP_Sales.DL	JP_con.Auth	JP_Past.Coll	JP_Past.Auth	EN_Sales.DL	EN_con.Auth	EN_Past.Coll	EN_Past.Auth	Average
Year	1.00	-0.06	0.06	0.02	-0.02	0.02	0.00	0.01	0.00	0.02
JP_Sales.DL	-0.06	1.00	0.36	-0.06	0.16	0.08	-0.19	-0.05	-0.03	0.12
JP_con.Auth	0.06	0.36	1.00	0.06	0.24	0.15	0.02	0.13	0.17	0.15
JP_Retro.Coll	0.02	-0.06	0.06	1.00	0.17	0.02	0.09	0.16	0.12	0.09
JP_Retro.Auth	-0.02	0.16	0.24	0.17	1.00	0.07	-0.08	0.07	0.09	0.11
EN_Sales.DL	0.02	0.08	0.15	0.02	0.07	1.00	0.12	0.16	0.13	0.09
EN_con.Auth	0.00	-0.19	0.02	0.09	-0.08	0.12	1.00	0.27	0.23	0.12
EN_Retro.Coll	0.01	-0.05	0.13	0.16	0.07	0.16	0.27	1.00	0.81	0.21
EN_Retro.Auth	0.00	-0.03	0.17	0.12	0.09	0.13	0.23	0.81	1.00	0.20

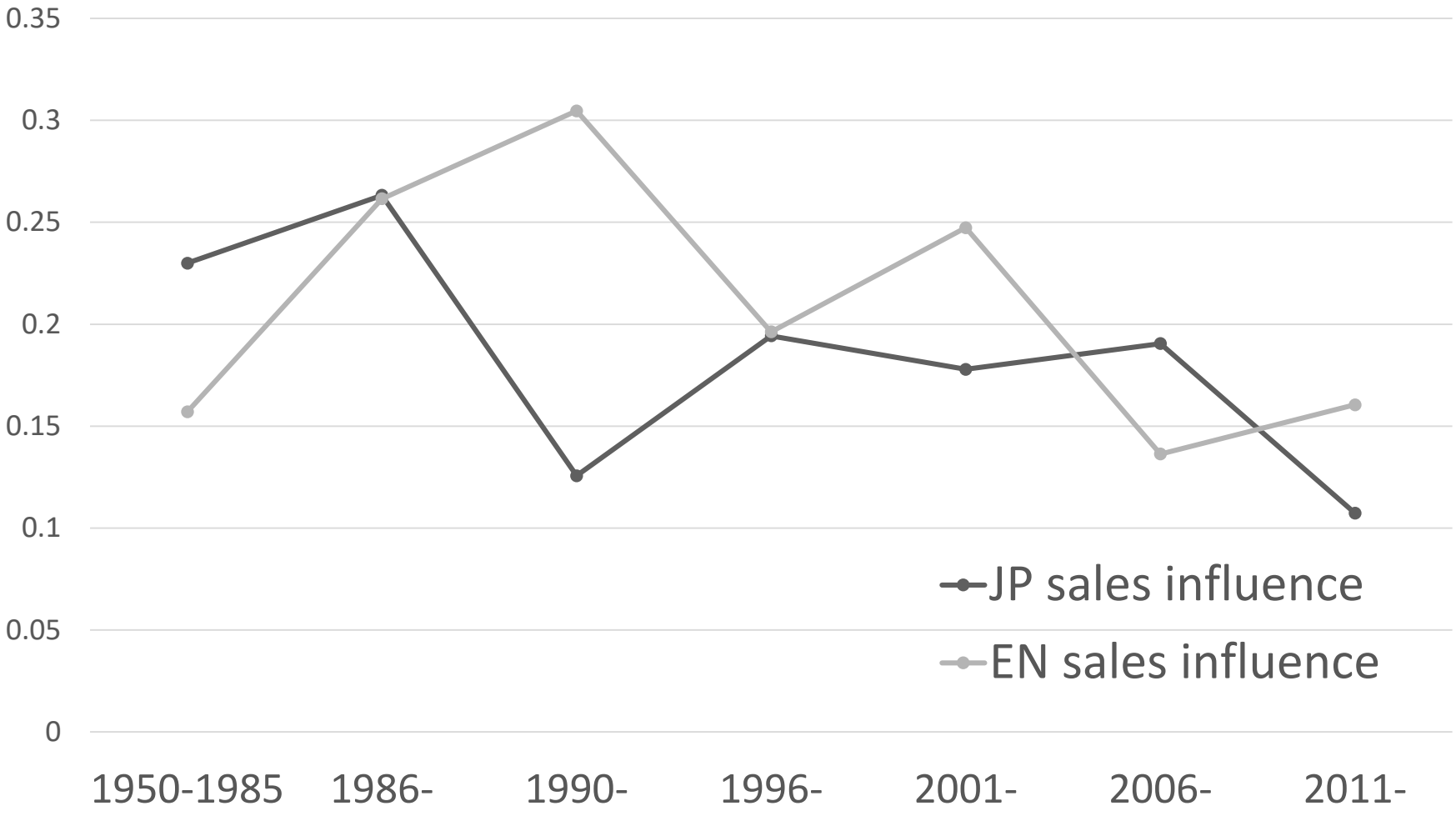
Correlation coefficient 2011-2015

2011-2015	Year	JP_Sales.DL	JP_con.Auth	JP_Past.Coll	JP_Past.Auth	EN_Sales.DL	EN_con.Auth	EN_Past.Coll	EN_Past.Auth	Average
Year	1.00	-0.22	0.03	-0.09	-0.14	-0.06	-0.01	-0.10	-0.10	0.09
JP_Sales.DL	-0.22	1.00	0.24	-0.04	0.05	0.03	-0.18	0.01	0.00	0.09
JP_con.Auth	0.03	0.24	1.00	0.02	0.17	0.15	-0.22	0.12	0.11	0.13
JP_Retro.Coll	-0.09	-0.04	0.02	1.00	0.02	0.14	0.17	0.27	0.24	0.12
JP_Retro.Auth	-0.14	0.05	0.17	0.02	1.00	0.06	-0.08	0.10	0.08	0.09
EN_Sales.DL	-0.06	0.03	0.15	0.14	0.06	1.00	0.08	0.20	0.21	0.11
EN_con.Auth	-0.01	-0.18	-0.22	0.17	-0.08	0.08	1.00	0.37	0.33	0.18
EN_Retro.Coll	-0.10	0.01	0.12	0.27	0.10	0.20	0.37	1.00	0.85	0.25
EN_Retro.Auth	-0.10	0.00	0.11	0.24	0.08	0.21	0.33	0.85	1.00	0.24

Result

- Correlation coefficient
- Multivariate analysis
  - ~~Principal component analysis(PCA)~~
  - Exploratory Factor Analysis(EFA) / simplimax
  - Structural Equation Modeling(SEM)

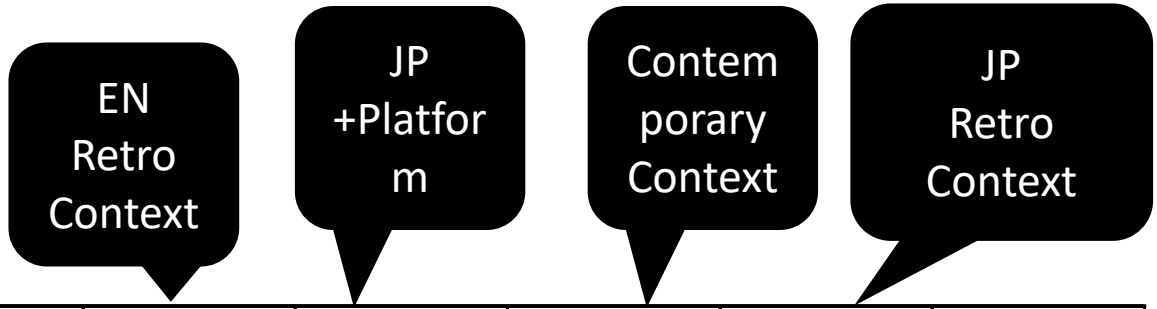
Sales correlation to other review domains
(in important videogame titles)



Result

- Correlation coefficient
- Multivariate analysis
  - Exploratory Factor Analysis(EFA)
  - Structural Equation Modeling(SEM)

Exploratory Factor Analysis(EFA)



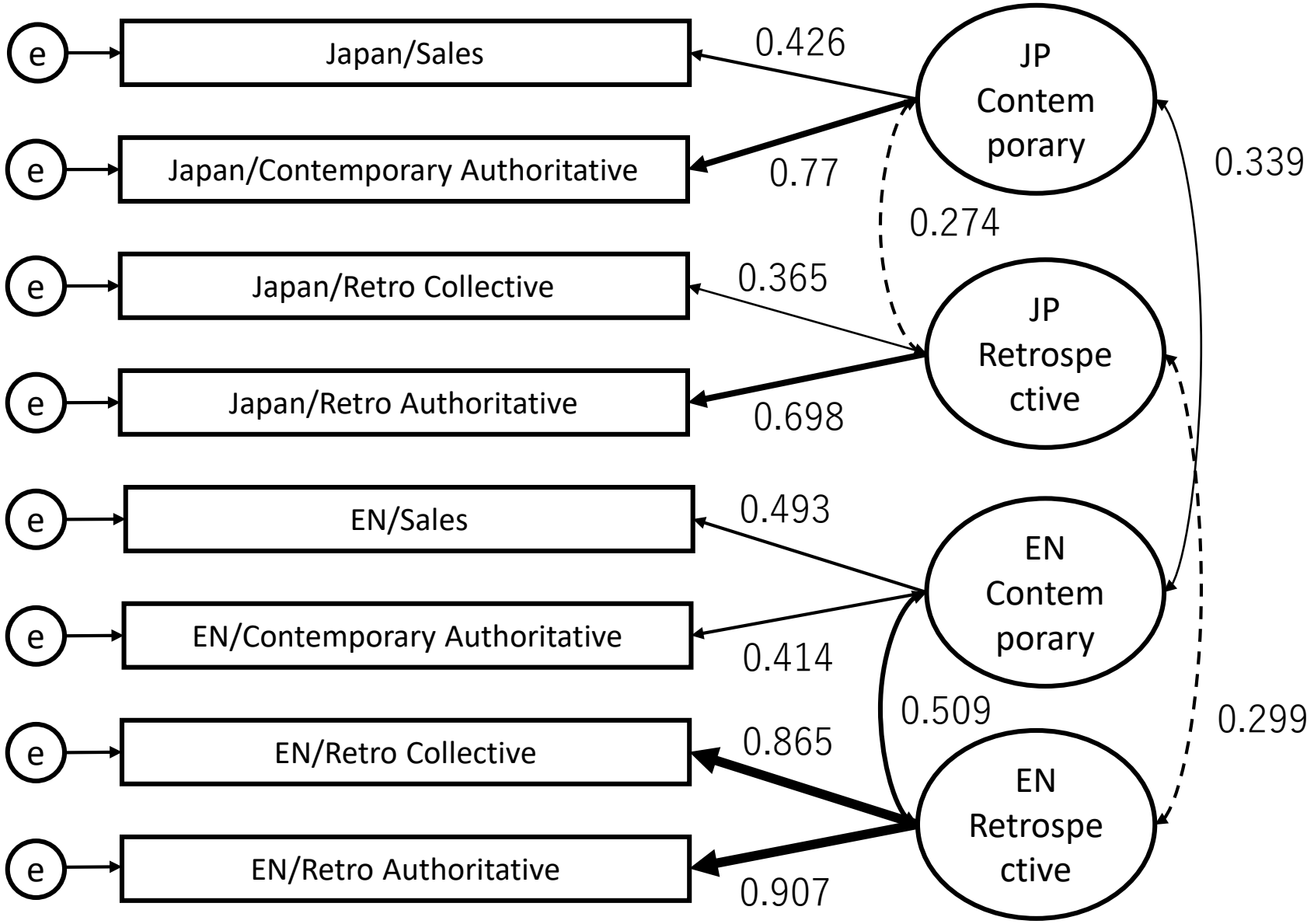
		Factor I	Factor II	Factor III	Factor IV	Factor V
Platform		0	0.64	-0.25	0	-0.26
Release Year		0	-0.14	0.57	-0.25	0.09
Japan Context	Sales/DL	0.08	0.42	0.17	-0.01	0.05
	Contemporary-Authorit	0.15	0.58	0.34	0	0.11
	Retrospective-Collectiv	0.14	0.19	-0.32	0.27	0.24
	Retrospective-Authorit	0.16	0.32	-0.16	0.26	0.35
English Context	Sales/DL	0.2	0.2	0.23	0.05	-0.11
	Contemporary-Authorit	0.23	-0.13	0.33	0.01	0
	Retrospective-Collectiv	1	0	0	0	0
	Retrospective-Authorit	0.79	0.14	0	0.43	-0.1

Method: simplimax
RMSR: 0.02

The df corrected root mean square of the residuals : 0.04
RMSEA index = 0.052

SEM(Structural Equation Modeling)

CFI:0.968
RMSEA:0.053
SRMR:0.036



Findings

1. Until 1990s, the strongest correlation between JP and EN context was Sales data. But, JP/EN videogame Sales correlation coefficient was decreasing after 1990s.
2. Sales Influence to other review domains(awards, review, book, museum) was decreasing gradually. Probably, each review domain made original criteria.
3. English reviews tendency are very resemble. Above all, English retrospective reviews have the same characteristics. The other hand Japanese review categories criteria relatively independent in each.

(As a result?) English contexts and Japanese contexts were coming separated.

New Questions

- Why did English review categories making strong cluster?
- We have to Inspecting causality of sales influence decreasing and contexts separating.

Further Studies

1. Data quantity
   - Updating data
2. Data aggregation accuracy
   - Work level DB
   - Name Identification problems
3. Making Valid Index
   - Applying Factor Analysis result score
4. More Statistical Approach
   - Inspecting causality
5. To Publicize these data

Thank you for listening

mail : akitoinoue.ac@gmail.com