Trends of evaluation items to landscape appreciation until 2017 in the English journals

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Introduction
We have considered trends of landscape appreciation since JpGU2013-2018. According to the definition of landscape phenomena proposed by Prof. O. Shinohara (Fig. 1), we reported the trends of studies in each part of the phenomena.

Aoki, Y. (1999) described the first landscape evaluation using psychometrical methods to be pioneered by Peterson, G.L. (1967). Before this development, they tried to find the landscape appreciation using various descriptors. They were mostly belonging to the literature or the paintings. As for the literature, the first description of mountain was found in Francesco Petrarca in 1336 of France (Kondo, T. 2002). But his description has no reliable evidence to ensure the landscape. In the field of art, Albrecht Altdorfer drew the first natural landscape in the beginning of 15th century of Germany (Cavaliere, B. 1989). But we could not measure the physical data from his picture. The literature and the art found the beauty of natural landscape by these examples. They recorded the aesthetic beauty in landscape (Thiel, P. 1968).

Jay Appleton (1980) explained the scientific reason of the landscape phenomena with physical data, e.g. geomorphysical data and meteorological data. He explained the landscape phenomena of two pictures, Constable's Weymouth Bay and Constable's sunset study of Hampstead Heath. His approach must be the scientific based explanation to find psychological phenomena of landscape using the geology and meteorology. But the psychological phenomena could deviate by the person observed and the results must be happened statistically. So the process of the landscape phenomena should be explained by stochastic process of psychology. Then scientists developed psychological approach to it.

Here, we summarize the appreciation item (the third component of the landscape phenomena).

1. The developments to establish the psychological scale of appraisal

In the trial of psychometrical method, Ekman & Kuennapas (1962) tested the difference of Nominal scale and Interval scale, and the development of SD method promoted to use many adjectives in the visual complexities (Berlyne & Peckham 1966). Hart & Graham (1967) considered “How to rate & rank landscape”.

In the development of the psychological scale, Heise (1969) tested the scale -3 to 3, and Zube, Anderson & Pitt (1973) used the numerical scale 3 to 14.

2. The psychological evaluation item of preference

Kaplan, Kaplan, & Wendt (1972) proposed to use preference for the landscape appreciation. Compared to the results obtained by SD method, “preference” is easy to understand among different cultural back ground and was popularized in many countries.

3. The developments and the use of SD method

As for the SD method proposed by Osgood & Suci (1955), it employed many pairs of adjectives to evaluate landscape and provided detailed impressions of landscape. The largest number of 240 adjectives was tested by Craik (1975). The results were too complicated and scientists would like to summarize the results. SBE (Terry & Boster 1976), AVQ (Arriaza etc. 2004) and others were statistical aggregation examples of this trial and the example of meaningful aggregation was “Coherence, Complexity, Legibility and Mystery” proposed by Kaplan (1987). These indicators were tested with the relation to the preference and other appreciations by many scientists (Stamps III 2004, and so on.).

4. Method of monetary term evaluation

Monetary term is another evaluation of landscapes and sometimes used in the physical planning (Fukahori & Kubota 2003).

5. Items based on the human behavior of landscape evaluation

The origin of the landscape appreciation was explained from the animal behavior of predation (Appleton 1975). This theory had discussed for a long time. And this behavior might propose a base appreciation of landscape (Aoki & Kitamura 2001). Consideration on the human activities, the reason of visit (Andereck et al. 1989) and the visitability (Abdulkarim & Nasar 2014) were examined and the photographing (Oku & Fukamachi 2006, Sugimoto 2013) were reported.

6. Other appraisals

There are many appreciation descriptors and even now the scientists are finding new descriptors (Collier & Scott 2008). Until now, we could find examples of this trial in absorption (Berlyne 1958), quietness (Womble & Studebaker 1981), beauty (Hull IV, Buhyoff & Daniel 1984), size (Coeterier 1994), fear and stress (Nasar & Jones 1997), positive and negative (Ryan 1998), aggression and violence (Kuo 2001), satisfaction (Kaplan & Austin 2004), overcrowding (Manning & Freimund 2004), openness (Dramstad et al. 2006), ugly (Ruell, Halleux & Teller 2013), and other descriptions.

Keywords: landscape appreciation, appreciation items, until 2017

Table Historical review of landscape appreciation items

Interesting subject	Name of authors	Year
Development of the SD method	Osgood, C.E. and Suci, G.J.	1955
absorption	Berlyne, D.E.,	1958
descriptive appreciation as aesthetic beauty	Thiel, P.,	1961
difference of Nominal scale and Interval scale	Ekman, G. and Kuennapas, T.	1962
SD method	Wright, B. and Rainwater, L.	1962
description	Halprin, L.,	1965
absorption	Berlyne, D.E. and Peckham, S.	1966
description	Noe, S. and Abernathy, B.L.	1966
landscape type	Hart W. J. and William W. Graham,	1967
absorption	Wohlwill, J.F.	1968
numerical scale from -3 to +3	Heise, D.R.,	1969
aesthetic and emotional	Shafer, E.L. and Mietz, J.	1969
objectivity	Craik, K.H.	1972
preference	Kaplan, S., Kaplan, R. and Wendt, J.S.	1972
scaling	Acking, C.A and Sorte, G.J.	1973
numerical scale from 3 to 14	Zube, E.H., Anderson, T. and Pitt, D.	1973
prospect-refuge theory	Appleton, J.	1975
SD method with 240 pairs of adjectives	Craik, K.H.	1975
SBE method; normalization of the results	Daniel, T.C. and Boster, R.S.	1976
monetary	McConnell, K.E.,	1977
SD method	Pedersen, D.M.	1978
SD method	Shuttleworth, S.	1980
preference	Nasar, J.L.,	1981
meaning	Russell, J.A. and Ward, L.M.	1981
quiet	Womble, P. and Studebaker, S.	1981
quiet	Hammitt, W.E.,	1982
preference	Mudrak, L.Y.,	1983
preference	Nasar, J.L.,	1983
SD method	Ruiz, J.P. and Gonzalez-Bernaldez, F.	1983
scenic beauty	Hull IV, R.B., Buhyoff, G.J. and Daniel, T.C.	1984
needs and fears	Talbot, J.F. and Kaplan, R.	1984
preference	Herzog, T.R.	1985
SD method	Abello, R.P., Bernaldez, F.G. and Galiano, E.F.	1986
preference	Talbot, J.F. and Kaplan, R.	1986
survey paper: Coherence, Complexity, Legibility, Mystery	Kaplan, S.	1987
SD method	Kobayashi, M., Higashiyama, J. and Kawasaki, K.	1987
preference	Talbot, J.F., Bardwell, L.V. and Kaplan, R.	1987
monetary	Anderson, L.M. and Cordell, H.K.	1988
preference	Herzog, T. and Smith, G.A.	1988
motivation to visit	Andereck, K. et al.	1989
evaluation by monetary term	Daniel, T.C., et al.	1989
SD method	Kaplan, R., Kaplan, S. and Brown, T.	1989
SD method	Ruiz, M. and Ruiz, J.P.	1989
preference	Gimblett, H.R.	1990
monetary	Green, C.H., et al.	1990
motivation to visit	Uysal, M., McDonald, C.D. and Reid, L.J.	1990
quiet	Ulrich, R.S. et al.	1991
preference	Chokor, B.A	1992
preference	Herzog, T.	1992
refuge provides shelter	Hudson, B.J.	1992
effect to land price	Orland, B., Vinning, J. and Ebreo, A.	1992
familiarity	Purcell, A.T.	1992
description: literature works	Ikeda, T. and Konno, A.	1993
size of space	Coeterier, J.F.,	1994
identity	Hull IV, R.B., Lam, M. and Vigo, G.	1994
preference	Stamps III, A.E.	1994
preference	Strumse, E.	1994
preference	Sullivan III, W.C.,	1994
prospect-refuge theory reviewed	Appleton, J.,	1995
motivation to visit	Cha, S., McCleary, K.W. and Uysal, M.	1995
preference	Mealey, L.	1995
preference on tree form	Sommer, R. and Summit, J.	1995
preference	Herzog, T.R. and Gale, T.A.	1996
scenic preference in Finland	Karjalainen, E.	1996
scaling	Tahvanainen, L., Tyrvainen, L. and Nousiainen, I.	1996
Notation for a Participatory Envirotecture	Thiel, P.,	1996
fear and stress	Nasar, J.L. and Jones, K.M.	1997
landscape preferences of USA, Ireland, Senegal	Newell, P.B.	1997
quiet	Caffyn, A. and Prosser, B.	1998
preference	Herzog, T.R.,	1998
consistency of evaluation by rank order and graphical scale	Karjalainen, E. and Komulainen, M.	1998
preference	Kuo, F.E., Bacaicoa, M. and Sullivan, W.C.	1998
preference and naturalness using Scrub-forest, wide-close view, nature-altered	Purcell, A.T. and Lamb, R.J.	1998
positive and negative scenery of river frontland	Ryan, R.L.	1998
monetary	Tyrvainen, L. and Vaananen, H.	1998
preference	Brown, T.J., Kaplan R. and Quaderer, G.	1999
tranquility and preference	Herzog, T.R. and Barnes, G.J.	1999
preference	Summit, J. and Sommer, R.	1999
landscape preference in Australia	Herzog, T.R. et al	2000
landscape preference in Israel	Misgav, A.	2000
Phylogenic and Ontogenic evolution of landscape appreciation	Aoki, Y. and Kitamura, S.	2001
correlation between preference and likeliness	Hagerhall, C.M.	2001
motivation of ecological behavior	Hartig, T.	2001
aggression and violence	Kuo, F.E.,	2001
preference and danger	Herzog, T.R. and Kutzli, G.E.	2002
landscape preference in Norway	Kaltenborn, B.P. and Bjerke, T.	2002
positive and negative scenery of rural living	Ryan, R.L.,	2002
comparison of VOC and SBE	Franco, D. et al.	2003
cost and amenity level of road scenery	Fukahori, K. and Kubota, Y.	2003
preference	Herzog, T.R. and Leverich, O.L.	2003
AVQ index for visual quality	Arriaza, M. et al.	2004
preference	Herzog, T.R. and Kropscott, L.S.	2004
satisfaction of nature	Kaplan, R. and Austin, M.E.	2004
over crowding by photo montage method	Manning, R.E. and Freimund, W.A	2004
SBE difference 1976-1996	Palmer, J.F.	2004
preference did not correlate to mystery, complexity, legibility, coherence	Stamps, III, A.E.	2004
preference and danger by visibility	Herzog, T.R., & Kirk, K.M.	2005
preference by pair comparison	Rodiek, S.D. and Fried, J.T.	2005
proper openness, student and locals	Dramstad, W.E., et al.	2006
essential features for scenic beauty	Ergin, A., Williams, A.T. and Micallef, A.	2006
landscape preferred in Turkey	Kaplan, A., Taskin, T. and Onenc, A.,	2006
photographing by activity	Oku, H., & Fukamachi, K.	2006
disturbance, naturalness, visual scale, place identity in the photographs	Tveit, M., Ode, A. and Fry, G.	2006
mystery did not affect preference	Herzog, T.R. and Bryce, A.G.,	2007
words interested in the interview	Collier, M.J. and Scott, M.J.	2008
preference of transportation system; vegetation, distance, side fascia affected	Bernasconi, C. et al.	2009
beautiful high mountain, Sherpa appreciate flora, ugly garbage site no vegetation at Everest	Beza, B.B.	2010
species-rich of middle ground affect like of alpine landscape	Lindemann-Matthies, P. et al.	2010
naturalness, unity affect preference of Spruce forest landscape in Turkey	Eroglu, E. and Acar, C.	2011
surprise and Mystery affect preference, Turkey find Mystery at curved street	Nasar, J.L. and Cubukcu, E.	2011
ugly impression of brown fields and montage support improvement in Belgium	Ruelle, C., Halleux, J.-M. & Teller, J.	2013
Visitability	Abdulkarim, D. and Nasar, J. L.	2014
oppressiveness	Asgarzadeh, M. et al.	2014
threat	Chiang, Y-C., Nasal, J. and Ko, C-C.	2014
variance affected by evaluation value	Kalivoda, O. et al.	2014
forest and park affected stress relief	Tyrvainen, L., Ojala, A., Korpela, K. Lanki, T., Tsunetsugu, Y., Kagawa, T.	2014
proper understorey affect preference	van der Wal, R., Miller, D., Irvine, J., Fiorini, S., Amar, A., Yearley, S. Gill, R. & Dandy, N.	2014
openness	Weitkamp, G., Lammeren, R. and Bregt, A.	2014
risk of bushfire	Gill, N. et al.	2015
water use affect landscaping preference	Hayden, L., et al	2015
panorama tree cover density affect to preference	Jiang, B., et al.	2015
green roof affect restorativeness	Lee, K.E., Williams,K.J.H., Sargent, L.D., Williams, N.S.G., Johnson, K.A	2015
aesthetic, morphological condition and ecological integrity	McCormick, A, Fisher, K. and Brierley, G.	2015
water, reed, litter, dead wood affected preference	Eder, R., & Arnberger, A.	2016
tree coverage affect stress recovery	Jiang, B., Li, D., Larsen, L. & Sullivan, W.C.	2016
visual realism and sound affect preference	Lindquist, M., Lange, E. & Kang J.	2016
change of motivation	Shalev, I.	2016
cultural values in visual object	Sowinska-Swierkosz, B.N., Chmielewski, T.J.	2016
visual green reduces noise annoyance	Van Renterghem, T. & Botteldooren, D.	2016
public litter and fishing litter affect preference	Wyles, K.J., Pahl, S. Thomas, K. & Thompson, R.	2016
disorder affect fear of crime	Biasi, Alaina De	2017
nature contact reduce depression, anxiety, stress in outside experience	Brooks, A.M. et al.	2017
biodiversity affected preference	Cracknell, D. et. al.	2017
dead wood affected preference	Gundersen, V., Stange, E.E., Kaltenborn, B.P. Vistad	2017
EAB infestation affect crime, theft, breaking entering, property crime	Kondo, M.C., Han, S., Donovan, G.H., MacDonald, J.M.	2017
preference increase 4bit designed complexinformation entropy values	Kuper, R.	2017
wind generator affect to EEG (electroencephalographic)	Murcia, G. et al.	2017
natural scenery affect change of heart rate by CT scan	Zijlstra, E. et. Al.	2017
attributes affected to landscape aesthetic value of CVM	Dupras, J. et al.	2018
point elements affect preference	Haefner, K. et al.	2018
dense vegetation preferred in city	Harris, V. et al.	2018
motivation of park visit	Hecke, Linde, et al.	2018
firing affect emotional wellbeing	Knez, I. et al.	2018
mature oak with anemone preferred	Nielsen, A.B., Gundersen, V.S. & Jensen, F.S.	2018
traditional landscape preferred by residents in central Alps	Pecher, C., et al.	2018
photo points located by GIS	Sugimoto, K.	2018
setting and arrangement affect restrativeness	Tabrizian, P., et al.	2018
forest preference of 4 seasons	Bravo-Vargas, V. et al.	2019

behavioral consideration
developments in scaling
monetary approaches
use of preference
developments in SD method
other appreciation