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Socioenvironmental Factors Affecting EFL Reading in Japan:
A Consideration of the Ecological Systems Approach

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Abstract

This exploratory study investigates EFL reading in Japan as an ecological system in social contexts, focusing on strategy use, motivation, and beliefs, based on Bronfenbrenner's (1979) ecological systems approach. So far, the main theme of L2 reading research has been L2 readers' cognitive and affective aspects, or comprehension processes and motivation. Social contexts of L2 reading have not been included in most studies, if in any at all. In the ecological systems approach, all hierarchical structures of social contexts are considered to affect individuals' learning processes and outcomes. A set of questionnaires were used to gather data from Japanese university students. The relationships of their microsystem with their socioenvironmental factors were examined using structural equation models and a combination of cluster analysis and ANOVA. Results showed the strong possibility that EFL reading as a microsystem is affected in social contexts and that the macrosystem is more influential than the mesosystem and exosystem in Japanese society. Findings support the validity and necessity of including social contexts in L2 reading research, providing a more comprehensive understanding.

1. Background and Theoretical Framework

Second language (L2) reading research has focused on cognitive domains, like identification of reading process models (Carrel, Devine, & Eskey, 1988) in addition to proficiency and strategy use. Actually, a great number of studies have investigated the relationship between L2 readers' strategy use and proficiency, leading almost exclusively to the conclusion that the development of their strategy use can contribute to enhancing their reading proficiency (e.g., Carrel, 1989; Grabe, 1991; kern, 1989).

Only recently, L2 reading motivation has been recognized as an indispensable aspect of L2

reading research, since motivation is esteemed one of the most important affective factors in L2 reading (Grabe, 2009). To date, L2 reading motivation research has been limited (e.g., Mori, 2002; Takase, 2007) to using the framework of first language (L1) reading motivation for English-speaking children, based on Guthrie, Wigfield, and Perencevich's (2004) study. The basic suggestions of these L2 studies are that intrinsic and extrinsic motivations are two key concepts in L2 reading, along with in L1 reading, and that intrinsic motivation can play a more vital role than extrinsic motivation in L2 reading.

Social contexts, or *socioenvironmental factors*, of L2 reading have scarcely been discussed, although L2 acquisition (SLA) needs to explain the complexity of human learning in the environment beyond cognitive and affective boundaries (e.g., Batstone, 2010; Lantolf, 2000). In L2 reading research, Grabe (2009) highlighted the comprehensive social factors in reading development in an independent chapter. In this chapter, the main focus was the relationships among L1 reading abilities, academic achievement, and social factors in the U.S. K-12 setting, including many cases of minority children who are learning to read in L2 English at school. The general conclusion was that social factors such as *socioeconomic status* (SES) of parents, the *home literacy environment* (HLE) of children, *family* (and ethnic group) *beliefs and values*, and *literacy development interventions* at school and/or in local communities can influence the development of L1 reading abilities and academic achievement of school children, suggesting that these factors can also affect the same children's L2 reading development.

In numerous L1 studies, the SES of parents has been considered a predictive factor for their children's cognitive development and academic achievement, including reading comprehension. In many studies, the typical indicators of SES have been parents' occupation, educational levels, and incomes. For example, Mistry, Biesanz, Chien, Howes, and Benner (2008) examined the relationships between the SES and cognitive development of preschool children from almost 1,500 low-income families using path analysis and reported direct and indirect effects of SES and also stronger effects of maternal education levels than of household income as a predictor for cognitive development. Hart, Petrill, Deckard, and Thompson (2007) also reported that maternal education levels were related to general cognitive ability and its stability in early childhood, analyzing data from almost 300 pairs of kindergarten and first-grade twins. Noble, Farah, and McCandliss (2006) reported multiplicative relationships between SES and phonological awareness in L1 decoding skills using regression analysis among 150 first-graders of varying SES and demonstrated that poor access to resources may increase cognitive risk factors for decoding skills and that great access may buffer such risk factors.

The HLE of children, prominently, mothers' involvement, has been reported as influential

factors in the development of their L1 reading abilities. For example, Niklas and Schneider (2013) investigated the relationships of HLE with early childhood development of L1 vocabulary and phonological awareness among almost 1,000 kindergarten and first-year children in Germany using an HLE questionnaire (mainly about the reading behavior of parents and children) and language tests. The results analyzed by SEM showed that HLE was a good predictor of gains in early L1 vocabulary and phonological awareness, highlighting the importance of HLE for the development of L1 reading abilities. At the same time, chaotic HLE situations were reported to adversely affect children's early cognitive development (Hart et al., 2007). In line with these results, Dieterich, Assel, Swank, Smith, and Landry (2006) examined whether maternal involvement in three- and four-year old children's language use can predict their later age reading abilities. After analyzing longitudinal data from approximately 270 mothers and their children through SEM, they reported that maternal verbal support in early childhood helped develop L1 reading abilities at later school age. Similar results were provided in several studies (e.g., Mistry et al., 2008; Smith, Landry, & Swank, 2000). These results indicate that rich language input at home and positive maternal involvement in early childhood can contribute to children's later age development of L1 reading abilities.

Family beliefs and values have also been recognized as influential on the development of L1 reading abilities. Grabe (2009) concluded from some previous studies that parents who value their children's education influence L1 reading development. Raviv, Kessenich, and Morrison (2004) reported positive relationships between maternal attitudes (hostility, supportiveness, and respect for autonomy) and L1 verbal comprehension abilities among three-year old children in more than 1,000 families, based on observation data of parenting analyzed by correlations and SEM. Yamamoto, Holloway, and Suzuki (2006) examined the relationships between maternal beliefs and engagement in L1 reading at home among approximately 110 mothers in Japan who had five- or six-year old children, using *t*-test and Chi-square analyses for interview and questionnaire data. The results showed that mothers who reported reading to their children every day had higher parenting self-efficacy and a stronger sense of family responsibility than those who reported reading less, although the focus of this study was not on their children's reading development.

Literacy development interventions are believed to contribute to the enhancement of L1 reading abilities. Concept-oriented reading instruction (CORI) is considered one of such schemes, which aims to encourage children to obtain comprehension skills through cognitive strategy use, motivate themselves through successful reading, increase general conceptual knowledge, and engage in social interactions for effective learning (Guthrie et al., 2004). Guthrie et al. provided some empirical evidence to show the practical advantages of CORI classrooms over traditional

classrooms in the third and fifth grades, such as increased intrinsic motivation, higher comprehension scores, and transfer of strategy use among CORI students.

In sum, socioenvironmental factors are thought to affect the development of school children's L1 reading abilities. However, these factors must be reinvestigated to confirm whether they are applicable to EFL reading, or the reading of university L2 students, who learn at a different stage of developmental, and also in a different school system and a social setting. In the context of EFL reading, different results can be obtained: The influence of socioenvironmental factors may differ in specific societies. Grabe (2009) pointed out the situation-specific nature of EFL reading in different societies.

The theoretical framework underpinning this study is the *ecological systems approach* (Bronfenbrenner, 1979). In this approach, human development is conceptualized and understood hierarchically, comprising the microsystem, mesosystem, exosystem, and macrosystem. A *microsystem* is defined as "a pattern of activities . . . *experienced by the developing person* . . . *in the immediate environment* [emphasis added] (p. 15); a *mesosystem* as a series of "processes taking place between two or more settings *containing the developing person* . . . . *created by the interaction of developmentally instigative or inhibitory features* [emphasis added] . . ." (p. 22); an *exosystem* as a series of "processes taking place between two or more settings . . . in which events occur that *indirectly influence processes within the immediate setting* [emphasis added] in which the developing person lives" (p. 24); and a *macrosystem* as "the overarching pattern of micro- meso- and exosystems characteristic of a given culture, subculture, or other extended social structure, with particular reference to the *developmentally instigative belief systems* . . . *embedded in such overarching systems* [emphasis added]" (p. 25).

Based on the ecological systems approach, each system can be applied specifically to individuals' learning to read (microsystem), individuals' general learning environments, or homes and schools (mesosystem), communities in which individuals are broadly involved (exosystem), and sociocultural belief systems that influence individuals' English learning (macrosystem). This approach is considered a valid framework to study the influence of socioenvironmental factors on L2 reading because any aspect of education is characterized contextually or ecologically by its nesting structure (Bronfenbrenner, 1979; Lier, 2004). Batstone (2010) and Lantolf (2000) expressed similar ideas from the perspective of sociolinguistics to emphasize the interaction of learners with the environment. In the processes of L2 acquisition, it is generally believed that learners acquire linguistic skills through multiple experiences in their environment. The present study examined the influence of socioenvironmental factors by regarding EFL reading as an ecological system in social contexts, or a microsystem represented by several aspects of reading: strategy use,

motivation, and beliefs. One advantage of the ecological systems approach is to include the macrosystem in the framework for analysis. Sociocultural belief systems, which are agreeable among a majority of people or controversial from people to people in a society, have seldom been discussed in L2 reading research.

2. This Study

2.1 Research Hypothesis

From the perspectives of the ecological systems approach and sociolinguistic studies, socioenvironmental factors are considered to hierarchically affect EFL reading in Japan, and the influences are also inferred to indicate salient features in society.

2.2 Instruments

A set of questionnaires written in Japanese, participants' L1, was used to collect quantitative data for the four systems. All the items were rated on a five-point Likert scale, between 1 (*strongly disagree*) and 5 (*strongly agree*). Three existing scales (refer to Authors, 2013) were adjusted to evaluate the microsystem: 14 items for strategy use, 12 items for motivation, and 12 items for beliefs (38 items in total). To evaluate the socioenvironmental factors (mesosystem, exosystem, and macrosytem), a 29-item questionnaire was used: six items for HLE, five items for SES, six items for EDU (school education), five items for exosystem, and seven items for macrosystem (see Appendix 1).

The strategy questionnaire (Matsumoto, Hiromori, & Nakayama, 2013) was based on the Survey of Reading Strategies (SORS: Sheory & Mokhtari, 2001). SORS consisted of three subscales for Metacognitive Strategy (10 items), Cognitive Strategy (12 items), and Support Strategy (six items) to evaluate L2 English reading strategy use. Some items were revised for the EFL context of Japan, and the following subscales were created: Main Idea Strategy (e.g. *I take an overall view of the text content to see what it is all about*: five items, α=.824); Reasoning Strategy (*I interpret what is not clearly written in the text*: three items, α=.829); Adjusting Strategy (*I read difficult parts carefully again*: three items, α=.816); and Monitoring Strategy (*I check to see if my understanding of the text is correct after reading*: three items, α=.859). Only one principal component was extracted from each subscale, with the eigen value set more than 1.0, confirming that each subscale was composed of one component for strategy use: 2.252 for Main Idea; 1.926 for Reasoning; 1.840 for Adjusting; and 2.341 for Monitoring. The factor model was validated by SEM (GFI=.915, AGFI=.864, RMSEA=.056): Main Idea Strategy (β=.964, $p<.001$, R^2=.929);

Reasoning Strategy (β=.690, p<.001, R^2=.476); Adjusting Strategy (β=.550, p<.001, R^2=.308); and Monitoring Strategy (β=.857, p<.001, R^2=.735).

The motivation questionnaire (Matsumoto et al., 2013) was made on the basis of the Motivation for Reading Questionnaire (MRQ: Wigfield & Guthrie, 1997). MRQ consisted of three subscales: Intrinsic Motivation (14 items), Extrinsic Motivation (15 items), and Efficacy (eight items). Several items were revised to fit the Japanese EFL context, holding its original three subscales: Intrinsic Motivation (e.g. *I like challenging books written in English*: four items, α=.864); Extrinsic Motivation (*I would like to be recognized as a proficient reader of English*: five items, α=.815); and Reading Efficacy (*Special talent is unnecessary for reading comprehension in English*: three items, α=.784). Only one principal component was extracted from each subscale (eigen value>1.0), confirming that each subscale was composed of one component for motivation: 2.843 for Intrinsic; 2.882 for Extrinsic, and 1.885 for Efficacy. The factor model's validity was confirmed (GFI=.981, AGFI=.957, RMSEA=.022): Intrinsic Motivation (β=.573, p<.001, R^2=.329); Extrinsic Motivation (β=.624, p<.001, R^2=.389); and Reading Efficacy (β=.793, p<.001, R^2=.629).

The belief questionnaire (Matsumoto et al., 2013) was revised from a belief scale developed by Ueki (2002) for use. The original scale consisting of three subscales (learner orientations for Strategy, Environment, and Effort: six items for each) was used to evaluate learner beliefs among Japanese high school students. The scale was adjusted to match university students, holding its original three subscales: Strategy Orientation (e.g. *It is effective to change the way of learning voluntarily*: four items, α=.778); Environment Orientation (*My grades will improve if I am taught by good teachers*: four items, α=.715); and Effort Orientation (*It is effective to increase learning hours*: four items, α=.836). Only one principal component was extracted from each subscale (eigen value>1.0), confirming that each subscale was composed of one component for beliefs: 2.098 for Strategy, 1.986 for Environment, and 2.312 for Effort. SEM validated the factor model (GFI=.994, AGFI=.981, RMSEA=.000): Strategy Orientation (β=.793, p<.001, R^2=.629); Environment Orientation (β=.636, p<.001, R^2=.404); and Effort Orientation (β=.708, p<.001, R^2=.501).

Three scales were devised to estimate the mesosystem with reference to relevant literature (e.g., Grabe, 2009; Mistry et al., 2008; Nikos & Schneider, 2013): HLE, SES, and EDU. Confirmatory factor analysis was carried out independently of each other because of comparatively low correlations among them. HLE was composed of six items: α=.756; e.g. *My mother read me Japanese picture books in my childhood*; GFI=.987, AGFI=.960, RMSEA=.000. Family or maternal beliefs were included in this scale, since they relate closely to HLE, e.g. *My mother likes*

reading Japanese books. SES was composed of five items: α=.586; e.g. *My family paid tuitions for a cram school(s) to enter a good high school or university*; GFI=.992, AGFI=.975, RMSEA=.000. Direct questions about SES were withheld because it could not be asked in a politically correct way; instead, several indirect questions resulting in being able to infer SES, like *My family generously bought me necessary reference books for my learning*, were chosen. EDU was included as a mesosystem factor, since it is another influential factor in addition to HLE and SES in the system. EDU comprised six items: α=.688; e.g. *I asked questions to high school teachers when I did not understand well* and *I taught each other with my high school classmates*; GFI=.982, AGFI=.952, RMSEA=.000. The internal consistency levels represented by alpha coefficients were comparatively low, but each scale's factor model was valid.

To estimate the exosystem and macrosystem, one scale was used respectively because none of the related literature has identified multiple factors within each system. As for the exosystem, ethnic groups' values and beliefs, which are considered influential in L1 reading, were not included in the exosystem, since the Japanese society is not regarded culturally diverse. The exosystem's scale consisted of five items: α=.609; e.g. *I read Japanese books at a local library (libraries) in my childhood* and *My neighbor(s) helped me with my school work in my childhood*; GFI=.986, AGFI=.946, RMSEA=.032. The macrosystem's scale was devised to assess sociocultural beliefs about English education in Japan, focusing on generally accepted ideas for some people or controversial issues for others. It consisted of seven items: α=.718; e.g. *Beginning to learn English at primary school is helpful* and *University entrance examinations should include an English proficiency test(s)*; GFI=.966, AGFI=.894, RMSEA=.071. The internal consistency levels were comparatively low, but each scale's factor model was almost valid.

2.3 Participants

Participants were 115 Japanese university undergraduate and graduate students, who had learned English for six years at the secondary education level and were learning it continuously. Most of them were first- and second-year students enrolled in five different reading-centered English courses, in a semester of 15 classes of 90 minutes each at a private university (n=91). The others were first-year students in a computer and information processing class and four graduate students in a research method class for English education, in a semester of 15 classes of 90 minutes each at a national university (n=24). They were sampled on the basis of their accessibility and proximity to the researcher. They were majoring in literature, laws, economics, business administration, engineering, and education. Their age range was 18 to 23 years, but they predominantly consisted of 18-year-olds, and the proportion of the sexes was almost equal.

2.4 Analysis and Procedures

Quantitative data gathered from a set of questionnaires were statistically analyzed, using SEM and a combination of cluster analysis and analysis of variance (ANOVA). For SEM, the minimum sample size on a priori G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007) calculation with a medium effect size f^2 (.15), alpha level (.05), power (.80), and number of predictors (1) was 55 observations. For ANOVA, the minimum sample size on the same calculation with a medium effect size f (.30), alpha level (.05), power (.80), and the number of groups (3) was 111 observations.

First, the relationships of the participants' microsystem with their upper systems were examined using 15 structural equation models with five predictor variables (socioenvironmental factors: HLE, SES, EDU, exosystem, and macrosystem) and three criterion variables (reading factors: strategy, motivation, and belief). The predictor variables were the means of observed items in each factor, and the criterion variables were latent ones defined by the means of observed subscale items in each factor (Appendix 2 includes a model structure example). A rationale for this modeling, or the direction of causality, was that the socioenvironmental factors were considered to hierarchically affect learning factors like EFL reading, as microsystem is nested contextually or ecologically in the social environment (Bronfenbrenner, 1979; Lier, 2004). Another rationale was that most of the socioenvironmental factors preceded EFL reading in order of time, which is assumed necessary for causal inference (e.g., Kline, 2016), although the data was based not on longitudinal observation but on retrospection. To examine the relationships, standardized partial regression coefficients (B), squared multiple correlation coefficients (R^2), probabilities (p), and goodness of fit indices (RMR, GFI, NFI, IFI, and RMSEA) were compared.

Second, from the perspective of categorical features of the participants, the same relationships were examined using a coordination of cluster analysis and ANOVA. To categorize the participants and find their categorical features, cluster analysis was conducted with all the 15 observed variables included at once, by Ward method and Euclidean squared distance, using z scores of the original Likert scale means for clarification. Each category, or cluster, was named after the number of clusters was determined by examining agglomeration coefficients, vertical icicle plots, and the completed dendrogram. Then ANOVA was conducted to confirm the outcomes by checking the mean differences of each category. This two-phased approach can classify participants and interpret the results with validation (Dörnyei, 2007; Grimm & Yarnold, 2010).

3. Results

3.1 Descriptive Statistics

Table 1 shows the descriptive statistics of the socioenvironmental and reading factors. The values of skewness and kurtosis show that all the variables were normally distributed within the range of an absolute value 2.0, which provides one of the prerequisites to conduct SEM.

Table 1 *Descriptive Statistics of the Socioenvironmental and Reading Factors*

	Socioenvironmental Factors				
	HLE	SES	EDU	Exosystem	Macrosystem
M	3.10	3.22	3.37	2.19	3.96
SD	.90	.77	.82	.85	.65
skewness	.14	−.73	−.18	.89	−.52
kurtosis	−.49	.97	−.34	.59	−.49

	Reading Factors									
	Strategy				Motivation			Belief		
	Main Idea	Reasoning	Adjusting	Monitoring	Intrinsic	Extrinsic	Efficacy	Strategy	Environment	Effort
M	3.47	3.61	3.85	3.24	3.66	3.87	3.75	3.93	3.83	4.04
SD	.68	.88	.87	.90	.92	.83	.84	.60	.67	.69
skewness	.14	−.17	−.50	−.02	−.43	−.70	−.21	−.21	−.70	−1.01
kurtosis	−.12	−.66	−.56	.02	−.25	.02	−.64	.04	1.60	1.59

Note. N=115. HLE=Home Literacy Environment, SES=Socioeconomic Status, and EDU=Education. Strategy consists of Main Idea, Reasoning, Adjusting, and Monitoring; Motivation consists of Intrinsic, Extrinsic, and Efficacy; and Belief consists of Strategy, Environment, and Effort. Values were calculated based on a five-point Likert scale.

3.2 Comparison of Structural Models

Table 2 compares 15 structural models to estimate the influence of socioenvironmental factors on reading factors. The use of ordinal data must meet three critical assumptions in SEM: normal distribution of data, sufficient sample size, and minimal observed variables (Byrne, 2010). The first assumption was met with valid skewness and kurtosis, as mentioned above. For the second assumption, a sample size five to ten times as many as the number of parameters (each straight arrow including one for residuals counted as a parameter) is necessary in a model (Grim & Yarnold, 1995). The number of participants (N=115) accommodated eight or ten parameters in each of the 15 models. For the third assumption, the number of observed variables in each model was four or five, which was considered minimal. The power of this analysis on G*Power 3 with a medium effect size f^2 (.15), alpha level (.05), sample size (115), and number of predictors (1) stood at .98. Given that an acceptable level of Type Two error is .20, the power was more than sufficient. The specifications of each model are made available in Appendix 2 for in-depth scrutiny.

Table 2 *Comparison of Fifteen Structural Models Explaining the Influence of the Socioenvironmental Factors*

Predictor	Criterion	*B*	R^2	*p*	RMR	GFI	NFI	IFI	RMSEA	LO90	HI90
HLE	Strategy	.225	.050*	.036	.017	.995	.985	1.039	.000	.000	.046
	Motivation	.091	.008	.381	.023	.990	.980	.996	.043	.000	.196
	Belief	.23	.041*	.120	.020	.990	.940	.993	.034	.000	.192
SES	Strategy	.081	.007	.452	.021	.992	.974	1.029	.000	.000	.085
	Motivation	.196	.039*	.058	.012	.996	.992	1.009	.000	.000	.148
	Belief	.262	.068*	.047	.006	.999	.993	1.049	.000	.000	.095
EDU	Strategy	.190	.036*	.077	.027	.985	.956	1.008	.000	.000	.121
	Motivation	.094	.009	.364	.024	.987	.975	.992	.065	.000	.209
	Belief	.271	.073*	.046	.012	.996	.978	1.031	.000	.000	.144
Exosystem	Strategy	.174	.030*	.105	.022	.991	.973	1.027	.000	.000	.089
	Motivation	.210	.044*	.043	.014	.955	.990	1.006	.000	.000	.163
	Belief	.153	.024*	.216	.017	.993	.953	1.009	.000	.000	.176
Macrosystem	Strategy	.522	.273***	< .001	.023	.976	.939	.979	.065	.000	.156
	Motivation	.774	.600***	< .001	.020	.978	.975	.985	.115	.000	.245
	Belief	.622	.387***	< .001	.003	.999	.997	1.030	.000	.000	.063

Note. Fifteen structural models with five predictor variables (socioenvironmental factors) and three criterion variables (reading factors) were compared by standardized partial regression coefficients (*B*), squared multiple corelation coefficients (R^2), and several goodness of fit indices. These 15 models were constructed on the same basis for comparison.
*R^2 > .02=Small Effect **R^2 > .13=Medium Effect ***R^2 > .26=Large Effect, based on Ellis (2010).

Results indicate that each model was appropriate from the perspective of the goodness of fit, although the macrosystem-motivation model's RMSEA (.115, LO90=.000, HI90=.245) was moderately low. However, given that the other indices fell within the range of appropriateness, the model's fit was considered generally acceptable. In general, all the socioenvironmental factors were influential on the three reading factors. However, of all the models, the macrosystem models accounted for the three reading factors more strongly than the other models. More specifically, of all the macrosystem models, the macrosystem explained motivation (R^2=.600) more intensely than belief (R^2=.387) and strategy (R^2=.273). The results reveal that the sociocultural belief system about English in the Japanese society was more influential on EFL reading, in particular on the motivation to read English, than family, education, and community factors. These results encourage research on how macrosystem levels relate to reading and other socioenvironmental factors.

3.3 Categorization and Confirmation

Figure 1 is a three-group categorization of the participants, comprised of High Macrosystem (HM), Intermediate Macrosystem (IM), and Low Macrosystem (LM), which were named on the macrosystem levels in the SEM analyses. This categorization was based on the results of a cluster analysis with Ward method and Euclidean squared distance, using the *z* scores of the original

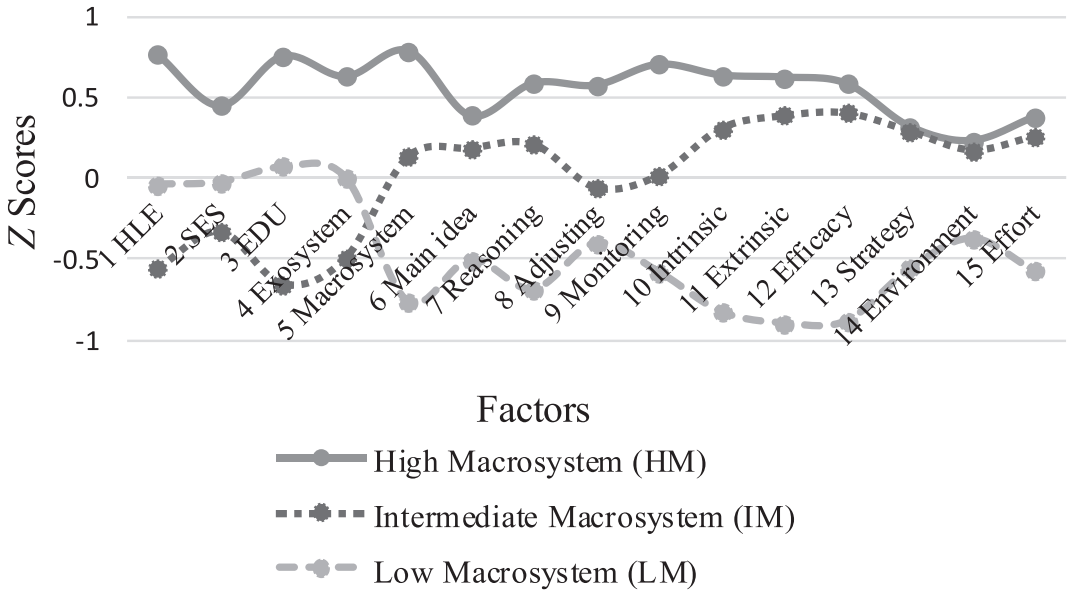

Figure 1. Three-group categorization by conducting Ward method and Euclidean squared distance cluster analysis, using the *z* scores of the Likert scale means for clarification: HM (n=32), IM (n=41), and LM (n=42).

Likert scale means. The number of groups was determined by examining agglomeration coefficients, vertical icicle plots, and the completed dendrogram. Eventually, three groups were considered optimal.

As a general tendency, the HM group (n=32) was high in all the reading and socioenvironmental factors; the IM group (n=41) was intermediate in the strategy section, relatively high in the motivation and belief sections, but low in the other socioenvironmental factors; and the LM group (n=42) was low in all the reading factors, but intermediate in the other socioenvironmental factors. These results confirm the macrosystem's stronger relationships with EFL reading. In other words, the sociocultural belief system appears to be a stronger predictor for reading factors and, in particular, for the motivation to read. The results also indicate a turnover tendency of socioenvironmental factors unless the macrosystem level is high. That is, there is the possibility of fluctuations below the middle macrosystem. All the results should be discussed in relation to social contexts, after this tendency is ensured by statistical tests.

The results in Table 3 confirmed the tendency of each group's characteristics shown in Figure 1: general differences by ANOVA (almost large effects) and specific differences between each group by post hoc comparisons. A power analysis based on G*Power 3 with a medium effect size f (.30), alpha level (.05), sample size (115), and number of groups (3) accounted for .82, which seemed acceptable. To summarize the results, the macrosystem levels (high, intermediate, and

low) were the most influential on the microsystem (EFL reading), although the socioenvironmental factors were generally influential.

Table 3 *Differences of the Means Across the High, Intermediate, and Low Macrosystem Groups*

	HM		IM		LM		ANOVA			Post Hoc Comparisons
	M	*SD*	*M*	*SD*	*M*	*SD*	*F* (2, 112)	*p*	η^2	
Socioenvironmental										
1 HLE	.77	.74	−.56	.79	−.03	.98	22.09	.000	.283***	HM>IM, LM*** LM>IM*
2 SES	.45	.72	−.33	1.20	−.02	.83	6.02	.003	.098**	HM>IM**
3 EDU	.76	.74	−.65	.78	.07	.94	26.60	.000	.323***	HM, LM>IM*** HM>LM**
4 Exosystem	.63	1.02	−.49	.67	.01	1.00	14.28	.000	.204***	HM>IM*** HM>LM>IM*
5 Macrosystem	.80	.54	.14	.89	−.76	.84	36.25	.000	.393***	HM, IM>LM*** HM>IM**
Strategy										
6 Main Idea	.39	.95	.19	.97	−.50	.87	9.62	.000	.147***	HM>LM*** IM>LM**
7 Reasoning	.59	.80	.22	.88	−.68	.87	22.27	.000	.285***	HM, IM>LM***
8 Adjusting	.58	.88	−.05	1.02	−.40	.87	10.12	.000	.154***	HM>LM*** HM>IM*
9 Monitoring	.71	.84	.02	1.06	−.58	.63	19.86	.000	.262***	HM>LM*** HM>IM>LM**
Motivation										
10 Intrinsic	.64	.69	.31	.89	−.82	.74	36.85	.000	.397***	HM, IM>LM***
11 Extrinsic	.63	.48	.39	.80	−.89	.84	46.93	.000	.456***	HM, IM>LM***
12 Efficacy	.59	.70	.41	.80	−.88	.75	43.77	.000	.439***	HM, IM>LM***
Belief										
13 Strategy	.33	.82	.30	.92	−.56	.98	11.92	.000	.176***	HM, IM>LM***
14 Environment	.24	1.15	.18	.80	−.37	.98	4.65	.012	.077**	HM, IM>LM*
15 Effort	.39	.74	.26	.85	−.57	1.07	12.71	.000	.185***	HM, IM>LM***

Note. N=115: HM (n=32), IM (n=41), LM (n=42). Values were based on the z scores of the Likert scale means.
*η^2>.01=Small Effect **η^2>.06=Medium Effect ***η^2>.14=Large Effect, based on Ellis (2010).
*p<.05 **p>.01 ***p<.001 for post hoc comparisons.

4. Discussion

This study investigated what socioenvironmental factors affect Japanese university students' EFL reading, focusing on strategy use, motivation, and beliefs, based upon Bronfenbrenner's (1979) ecological systems approach. The results largely converged to support the notion that social contexts can affect EFL reading as a microsystem, and that the macrosystem levels are the most influential on the microsystem. Although all the structural models explained the microsystem properly, the macrosystem models' performance was the most prominent of all, and the macrosystem explained motivation more intensely than strategy and belief. The following cluster and ANOVA analyses supported the possibility that the macrosystem levels are the most influential on the microsystem.

Thus, the research hypothesis is generally confirmed: EFL reading in Japan is hierarchically affected by socioenvironmental factors, and the influence is characterized by the dominance of

sociocultural beliefs in the society.

In the ecological systems approach, in which human development is understood hierarchically, the macrosystem is defined as an overarching system with instigative beliefs, embedded in each of the subsystems. The present study generally concluded that the macrosystem, a sociocultural belief system that influences individuals' learning English, is the most prominent predictor of the microsystem, along with the mesosystem and the exosystem. It is understandable that the macrosystem formulated in a society will influence individual readers' beliefs, since socially accepted beliefs must influence individuals' beliefs to a varying degree. Bronfenbrenner concluded that there are consistently characteristic behavioral and thought patterns in a society, and that the social patterns tend to agree with values and beliefs that its individual members possess. The conclusion that the macrosystem contributes to the formation of personal values and beliefs accounts for the influence of the macrosystem on Japanese university students' EFL reading beliefs. However, more consideration is necessary to explain why the macrosystem is influential on their EFL reading motivation.

In the SEM analysis, it was motivation that the macrosystem accounted for most prominently. This can be interpreted in a way that, in Japan, the macrosystem is very important to university students' learning motivation to read English, and that they are likely to endeavor to achieve their own goals of reading English, as they are driven considerably by social values shared in the society. Grabe (2009) stated that university entrance examinations and the associated expectations are influential in EFL settings. Actually, in Japan, university entrance examinations, which include reading in English, are very important events for many students and also for their parents. Besides, across the country, gaining English proficiency is considered important. English is compulsory in secondary schools, and learning through reading still occupies the central position. Many citizens are eager to advance English proficiency in their careers. In 2020, the new curriculum guideline will involve starting English education from primary school, to develop the English proficiency of pupils as early as possible. In sum, it is generally inferred that social values like this, or macrosystemic views among a majority of people, can enhance motivation to read English as an impetus to be successful in society.

A sociological study (Triandis, 1995), which analyzed the characteristics of individualism and collectivism, supports the validity of this inference. The study stated that, on an individualism versus collectivism continuum, Japanese society is located close to the collective end, though the location is situation-specific. Besides, it continued, a construct named *horizontal collectivism* is characterized by a sense of unity and solidarity in a society, and the profile of horizontal collectivism is thought to be salient in Japan. Specifically, the study cited that being different from

others implies being wrong in the Japanese society (Markus & Kitayama, 1991), though the perspective is different from person to person and changes over generations. The point is that a majority decision logic (*minna yatteru*: everybody is doing the same; *yokonarabi*: do what others do) tends to thrust social norms among people and to determine their behavior. It appears that, in the Japanese society where everybody is expected to follow the norms, social values or macrosystemic views are given great importance, and accordingly, efforts to follow the norms contribute to the enhancement of motivation to read English.

Lightbown and Spada (2013) mentioned the possibility that a learners' identity, or a characteristic commonly seen in a group of learners, can affect EFL learning, citing specific examples in Greer (2000). It stated that some Japanese students, even if they have high proficiency and motivation in English, are often reluctant to speak English or interact intentionally with a strong Japanese accent in communication classes, and that they make grammatical errors on purpose in grammar classes. These observations indicate that individual students are likely to learn English in class with a strong consciousness of their own performance among other learners, and try to avoid being perceived as superior. Despite their high levels of proficiency and motivation in English, this aspect of language learning is considered a characteristic of EFL learners in Japan, a tendency of being *normal* and *average* in EFL classrooms. It appears that the horizontal collectivism established as a learners' identity, rather than an individual learner's preference, tends to determine the behavior of Japanese EFL learners. Triandis (1995) also reported a similar tendency of following peer norms among adolescents to protect themselves from criticism in Japan.

Lastly, this study observed a turnover between the IM and LM groups in the three-group categorization (Figure 1). The IM group showed lower performance than the LM group in HLE, SES, EDU, and exosystem. The results cannot explain this phenomenon, but an interpretation is that the macrosystem levels are the most important predictor of EFL reading in Japan and that the other factors may fluctuate unless the macrosystem levels are high.

5. Conclusion

This exploratory study investigated EFL reading as an ecological system in social contexts. The overall results in this quantitative study indicate a general tendency that social contexts can affect EFL reading and that sociocultural influences are salient in the context of Japan. Evidence supports this conclusion by deducing from the ecological systems approach (Bronfenbrenner, 1979), horizontal collectivism (Triandis, 1995), and learners' identity (Lightbown & Spada, 2013). This study means a great deal to L2 reading research because the domain has scarcely discussed

social contexts that may affect L2 reading, and situation-specific research is absolutely necessary to fully understand the influences of social contexts.

Despite the importance of this study, results cannot answer what each participant thought about the socioenvironmental influences that he/she received, and why the socioenvironmental factors affected his/her EFL reading. Qualitative research like interviews is necessary to unravel the answers to these questions. EFL qualitative research enables SES and HLE to be compared specifically between EFL and L1 reading. However, the influence of SES and HLE appears to be weaker in the EFL context, since EFL is of less importance, and therefore, is not likely to be affected by SES and HLE.

This study's conclusion provides an important pedagogical implication. Secondary school teachers as well as university professors should understand that any social contexts including sociocultural beliefs can affect students' EFL reading performance and, in particular, their motivation to read EFL materials. Although this implication does not contribute to the methods of teaching EFL reading, EFL reading teachers must keep the insight in mind as an understanding necessary to motivate their students.

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Appendix 1: Socioenvironmental Scales

[HLE]

1. *I read Japanese books at home during my childhood.*
2. *My mother read me Japanese picture books during my childhood.*
3. *My father or other members read me Japanese picture books during my childhood.*
4. *I read Japanese books at home now.*
5. *My mother likes reading Japanese books.*
6. *My father and other family members like reading Japanese books.*

[SES]

7. *I attended a cram school(s) to enter a good high school or university.*
8. *My family paid tuitions for a cram school(s) to enter a good high school or university.*
9. *My family generously bought me the necessary reference books for my learning.*
10. *I have traveled abroad with my family.*
11. *I have been on an overseas study program.*

[EDU]

12. *I concentrated on every class at high school.*
13. *I asked questions to high school teachers when I did not understand well.*
14. *My high school classmates and I taught each other.*
15. *I studied with my friends after school during high school.*
16. *I read Japanese books at my high school library.*
17. *I participated in an extracurricular activity (activities) at high school.*

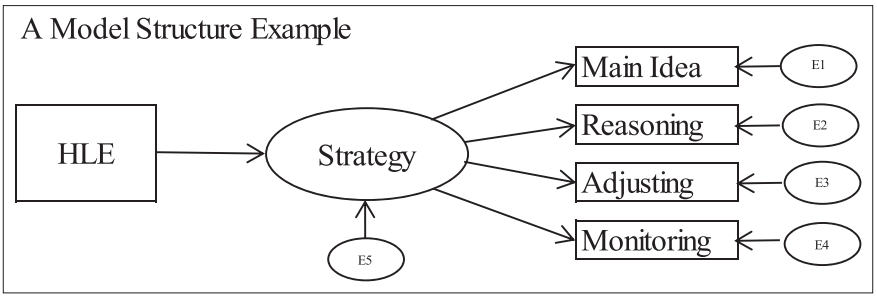
[Exosystem]

18. *I read Japanese books at a local library (libraries) during my childhood.*
19. *I read Japanese books at a local library (libraries) now.*
20. *My neighbor(s) helped me with my school work during my childhood.*
21. *My neighbor(s) read me Japanese books during my childhood.*
22. *I participated in a local volunteer activity (activities) during my childhood.*

[Macrosystem]

23. *Beginning to learn English in primary school is helpful.*
24. *Students can learn English well using authorized English textbooks.*
25. *University entrance examinations should include an English proficiency test(s).*
26. *Studying in English-speaking countries is useful.*
27. *Proficiency in English is required internationally and in the global community.*
28. *Proficiency in English is required domestically in Japan.*
29. *English should be learned in a way that it stays with you lifelong.*

Appendix 2: Specifications of the Structural Equation Models



Predictor	Criterion	Non-standardized				Standardized	
HLE	**Strategy**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
HLE	Strategy	.131	.063	2.097	.036	.225	.050
Strategy	Main Idea	1.000				.773	.597
Strategy	Reasoning	1.129	.211	5.363	< .001	.670	.449
Strategy	Adjusting	.857	.190	4.514	< .001	.517	.267
Strategy	Monitoring	.983	.201	4.883	< .001	.571	.326
		Variances of *SEM*					
	HLE	.796	.105	7.550	< .001		
e1	Main Idea	.183	.048	3.811	< .001		
e2	Reasoning	.425	.079	5.372	< .001		
e3	Adjusting	.547	.082	6.647	< .001		
e4	Monitoring	.544	.086	6.333	< .001		
e5	Strategy	.258	.066	3.898	< .001		
HLE	**Motivation**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
HLE	Motivation	.066	.075	.877	.381	.091	.008
Motivation	Intrinsic	1.000				.711	.506
Motivation	Extrinsic	.971	.142	6.830	< .001	.767	.588
Motivation	Efficacy	1.069	.156	6.844	< .001	.828	.686
		Variances of *SEM*					
	HLE	.796	.105	7.550	< .001		
e1	Intrinsic	.413	.072	5.691	< .001		
e2	Extrinsic	.280	.058	4.804	< .001		
e3	Efficacy	.222	.062	3.588	< .001		
e4	Motivation	.419	.107	3.936	< .001		
HLE	**Belief**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
HLE	Belief	.062	.040	1.556	.120	.203	.041
Belief	Strategy	1.000				.454	.206
Belief	Environment	1.023	.342	2.993	.003	.416	.173
Belief	Effort	2.085	.877	2.376	.017	.820	.673
		Variances of *SEM*					
	HLE	.796	.105	7.550	< .001		
e1	Strategy	.285	.048	5.953	< .001		
e2	Environment	.368	.058	6.366	< .001		
e3	Effort	.156	.127	1.232	.218		
e4	Belief	.071	.039	1.810	.070		

SES	Strategy	Estimate	*SEM*	Statistic	*P*	*B*	R^2
SES	Strategy	.055	.073	.752	.452	.081	.007
Strategy	Main Idea	1.000				.778	.606
Strategy	Reasoning	1.119	.212	5.288	<.001	.669	.448
Strategy	Adjusting	.843	.189	4.454	<.001	.512	.262
Strategy	Monitoring	.972	.201	4.830	<.001	.512	.262
		Variances of *SEM*					
	SES	.594	.079	7.550	<.001		
e1	Main Idea	.179	.049	3.641	<.001		
e2	Reasoning	.426	.080	5.337	<.001		
e3	Adjusting	.550	.083	6.660	<.001		
e4	Monitoring	.546	.086	6.333	<.001		
e5	Strategy	.274	.070	3.921	<.001		
SES	**Motivation**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
SES	Motivation	.164	.087	1.898	.058	.196	.039
Motivation	Intrinsic	1.000				.706	.498
Motivation	Extrinsic	.984	.144	6.823	<.001	.770	.593
Motivation	Efficacy	1.080	.158	6.845	<.001	.830	.688
		Variances of *SEM*					
	SES	.594	.079	7.550	<.001		
e1	Intrinsic	.419	.073	5.782	<.001		
e2	Extrinsic	.276	.058	4.774	<.001		
e3	Efficacy	.220	.061	3.589	<.001		
e4	Motivation	.400	.103	3.897	<.001		
SES	**Belief**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
SES	Belief	.106	.053	1.989	.047	.262	.068
Belief	Strategy	1.000				.523	.273
Belief	Environment	1.038	.335	3.103	.002	.487	.237
Belief	Effort	1.526	.521	2.931	.003	.691	.477
		Variances of *SEM*					
	SES	.594	.079	7.550	<.001		
e1	Strategy	.261	.048	5.485	<.001		
e2	Environment	.340	.058	5.911	<.001		
e3	Effort	.250	.081	3.090	.002		
e4	Belief	.091	.043	2.118	.034		
EDU	**Strategy**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
EDU	Strategy	.120	.068	1.768	.077	.190	.036
Strategy	Main Idea	1.000				.767	.588
Strategy	Reasoning	1.136	.213	5.325	<.001	.515	.447
Strategy	Adjusting	.860	.192	4.476	<.001	.515	.265
Strategy	Monitoring	1.011	.205	4.930	<.001	.582	.339
		Variances of *SEM*					
	EDU	.668	.088	7.550	<.001		
e1	Main Idea	.187	.048	3.839	<.001		
e2	Reasoning	.426	.079	5.370	<.001		
e3	Adjusting	.549	.083	6.646	<.001		
e4	Monitoring	.533	.086	6.234	<.001		
e5	Strategy	.258	.067	3.867	<.001		

EDU	Motivation	Estimate	*SEM*	Statistic	*P*	*B*	R^2
EDU	Motivation	.075	.082	.907	.364	.094	.009
Motivation	Intrinsic	1.000				.712	.507
Motivation	Extrinsic	.970	.142	6.834	< .001	.766	.587
Motivation	Efficacy	1.068	.156	6.894	< .001	.828	.685
		Variances of *SEM*					
	EDU	.688	.088	7.550	< .001		
e1	Intrinsic	.412	.072	5.683	< .001		
e2	Extrinsic	.280	.058	4.811	< .001		
e3	Efficacy	.222	.062	3.596	< .001		
e4	Motivation	.420	.107	3.940	< .001		
EDU	**Belief**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
EDU	Belief	.098	.049	1.999	.046	.271	.073
Belief	Strategy	1.000				.493	.243
Belief	Environment	.992	.326	3.046	.002	.439	.192
Belief	Effort	1.786	.650	2.746	.006	.763	.582
		Variances of *SEM*					
	EDU	.668	.088	7.550	< .001		
e1	Strategy	.271	.047	5.761	< .001		
e2	Environment	.360	.057	6.339	< .001		
e3	Effort	.220	.097	2.053	.040		
e4	Belief	.081	.040	2.017	.044		
Exosystem	**Strategy**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
Exosystem	Strategy	.108	.066	1.623	.105	.174	.030
Strategy	Main Idea	1.000				.775	.601
Strategy	Reasoning	1.118	.210	5.313	< .001	.665	.443
Strategy	Adjusting	.851	.190	4.485	< .001	.515	.265
Strategy	Monitoring	.988	.202	4.889	< .001	.575	.330
		Variances of *SEM*					
	Exosystem	.714	.095	7.550	< .001		
e1	Main Idea	.182	.049	3.738	< .001		
e2	Reasoning	.430	.079	5.409	< .001		
e3	Adjusting	.548	.082	6.650	< .001		
e4	Monitoring	.540	.086	6.292	< .001		
e5	Strategy	.265	.068	3.908	< .001		
Exosystem	**Motivation**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
Exosystem	Motivation	.160	.079	2.027	.043	.210	.044
Motivation	Intrinsic	1.000				.707	.500
Motivation	Extrinsic	.963	.141	6.807	< .001	.755	.571
Motivation	Efficacy	1.093	.160	6.849	< .001	.842	.708
		Variances of *SEM*					
	Exosystem	.714	.095	7.550	< .001		
e1	Intrinsic	.417	.073	5.757	< .001		
e2	Extrinsic	.291	.058	5.026	< .001		
e3	Efficacy	.206	.062	3.327	< .001		
e4	Motivation	.399	.102	3.905	< .001		

Exosystem	**Belief**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
Exosystem	Belief	.058	.047	1.237	.216	.153	.024
Belief	Strategy	1.000				.538	.290
Belief	Environment	.962	.318	3.029	.002	.465	.216
Belief	Effort	1.489	.543	2.742	.006	.695	.482
		Variances of *SEM*					
	Exosystem	.714	.095	7.550	< .001		
e1	Strategy	.255	.050	5.094	< .001		
e2	Environment	.349	.058	6.045	< .001		
e3	Effort	.247	.087	2.828	.005		
e4	Belief	.101	.049	2.087	.037		
Macrosystem	**Strategy**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
Macrosystem	Strategy	.391	.082	4.782	< .001	.522	.273
Strategy	Main Idea	1.000			< .001	.715	.511
Strategy	Reasoning	1.264	.224	5.645	< .001	.694	.481
Strategy	Adjusting	.981	.205	4.779	< .001	.548	.300
Strategy	Monitoring	1.088	.216	5.036	< .001	.584	.341
		Variances of *SEM*					
	Macrosystem	.415	.055	7.550	< .001		
e1	Main Idea	.223	.044	5.040	< .001		
e2	Reasoning	.400	.075	5.314	< .001		
e3	Adjusting	.523	.080	6.543	< .001		
e4	Monitoring	.531	.084	6.326	< .001		
e5	Strategy	.169	.047	3.560	< .001		
Macrosystem	**Motivation**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
Macrosystem	Motivation	.751	.104	7.199	< .001	.774	.600
Motivation	Intrinsic	1.000				.683	.467
Motivation	Extrinsic	1.111	.149	7.465	< .001	.842	.709
Motivation	Efficacy	1.026	.147	7.005	< .001	.763	.583
		Variances of *SEM*					
	Macrosystem	.415	.055	7.550	< .001		
e1	Intrinsic	.445	.069	6.443	< .001		
e2	Extrinsic	.197	.045	4.401	< .001		
e3	Efficacy	.294	.051	5.738	< .001		
e4	Motivation	.156	.045	3.482	< .001		
Macrosystem	**Belief**	**Estimate**	***SEM***	**Statistic**	***P***	***B***	R^2
Macrosystem	Belief	.290	.074	3.898	< .001	.622	.387
Belief	Strategy	1.000				.502	.252
Belief	Environment	1.071	.317	3.374	< .001	.482	.232
Belief	Effort	1.647	.430	3.832	< .001	.716	.512
		Variances of *SEM*					
	Macrosystem	.415	.055	7.550	< .001		
e1	Strategy	.268	.042	6.391	< .001		
e2	Environment	.342	.052	6.514	< .001		
e3	Effort	.233	.060	3.877	< .001		
e4	Belief	.055	.025	2.201	.028		