Examining the Underlying Structure of Expectancy-Value Theory in Diversity Education: A Comparative Exploratory Factor Analyses Study

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Yan Yang, Ph.D.
University of West Georgia

Abstract

The purpose of this study was to help bridge the gap between motivation and diversity education by examining the structural validity of Expectancy-Value (EV) theory in diversity education through a comparative exploratory factor analysis. Participants were 254 college students who were predominantly education majors (86.7%), White (60.6%), and female (76.4%). Separate exploratory factor analyses (EFA) produced very similar 2-factor structures in contrast with the five-dimensional model of EV theory: value and cost. While the results confirmed the domain-specific nature of EV theory, they raised parsimony concerns and suggested ways to help make diversity education more motivating. Future research needs to further examine the structural validity of EV theory and develop EV instruments for diversity education through confirmatory factor analysis.

Introduction

Understanding the value and cost beliefs in diversity education among college students is a pressing issue (Yang & Mindrila, 2018) as societies becomes increasingly diverse (United States Census Bureau, 2017). To meet the needs of increasing student diversity and promote a more equitable and just education, diversity education has become essential in the United States for over four decades (Banks, 1981). By 2000, diversity education had been institutionalized: 68% higher education institutions reported requiring students to take at least one diversity course to graduate (Humphreys, 2000) and 58% of bachelor degree granting institutions required some type of diversity education toward graduation (AAC&U, 2000). As an important motivation approach to learning (Eccles & Wigfield, 2002), Expectancy-Value (EV) theory has been widely used in a plethora of fields including physical education (Grasten, 2016), music education (Burak, 2014), and STEM education (Lykegaard & Ulriksen, 2016). All of the authors of these studies found that higher expectancy of success and task values tend to result in more motivation, persistence, resilience, and success. However, no known study has examined the role of EV theory in diversity education despite the urgent need. In a comparative study of the expectancy and value beliefs of U.S and Chinese middle school students, Sun, Ding, and Chen (2013) found that, while U.S students held higher expectancy beliefs, Chinese students had higher perceptions of attainment and utility values, suggesting cultural differences in expectancy-value motivation. However, no known studies to date have examined the role of EV theory in diversity education.

Due to its sensitive nature, diversity is hard to teach (Yang, 2018) and often met with resistance (Jackson, 1999), particularly during this time of political uncertainty. In one study, Jackson (1999) documented a set of unique issues when teaching diversity courses that generated various negative emotional reactions in students in forms of anger, avoidance, passivity, and

silence, which in turn resulted in resistance to learning from the students. For many students who grow up in a White-dominated society with pervasive monocultural beliefs and opinions, it can be challenging to overcome personal biases and beliefs (Doepker, 2015). However, it is extremely important for educators to develop a more global view for students beyond their own experiences, particularly those whose lives are too sheltered for an increasingly diverse world. Therefore, in an attempt to reduce student resistance and better understand student value and cost beliefs in learning about diversity, it is critical to approach diversity education from a motivational perspective. Toward this end, scholars have taken a general approach to study motivations in diversity education (Wlodkowski & Ginsberg, 1995). However, few studies have taken a specific motivational approach to diversity education (Yang & Montgomery, 2011; Yang, 2018). The present study adds to this emergent literature by applying expectancy-value (EV) theory to the context of diversity education through examining the underlying structure of EV theory in diversity education, focusing on students' specific value and cost beliefs in diversity education based on EV theory.

Expectancy-Value (EV) Theory Overview

Proposed by Eccles and colleagues (Eccles et al., 1983; Eccles & Wigfield, 1995, 2002), expectancy-value (EV) theory was initially studied in the domain of mathematics achievement. The tenet of the theory is that student motivation is jointly influenced by their expectancy of success and values they attached to the task. According to EV theory, expectancy and values are not only assumed to directly influence achievement (Bembenutty, 2008), but also performance, effort, and persistence (Wigfield & Eccles, 2000). Eccles et al. (1983) defined and measured *expectancy of success* as the beliefs of children about how well they can do on a particular task. Although it is empirically related to children's ability beliefs, Wigfield and Eccles (2000) argued

that it is conceptually different, in that expectancy of success focuses more on the future than ability beliefs. *Task values*, on the other hand, break down to *attainment value, intrinsic/interest value, utility value*, and *cost* (Eccles et al., 1983). *Attainment value* refers to the importance of doing well on a task, suggesting identifying the task with one's identity or personal value. *Utility value* is the usefulness of doing well on a task, focusing on how doing well on a task fits a future plan, and suggesting doing a task as a means to an end. *Intrinsic/interest value* suggests the enjoyment in doing a task due to personal or situational interest. *Cost* refers to the price one has to pay or the effort one has to make in accomplishing a task; it focuses on the fact that someone may have to cancel out other activities such as hanging out with a friend or watching a movie to engage in the given task. The four types of task values are conceptually different and arguably play different roles. For example, in a study assessing a technology design activity (Masson, Klop, & Osseweijer, 2016), interest and attainment values were found to be most important motivations of student participation among the four task values. Mason et al (2016) argued that interest and attainment values are the two values connected to educational principles of authentic practice (interest value), and providing meaningful contexts for scientific concepts (attainment value), which further differentiated between interest and attainment values.

In previous research, EV beliefs have been consistently found to be highly domain-specific (Bong, 2001; Gaspard et al., 2018; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Wigfield et al., 2015). Students tend to value one domain over the other, and they are prone to harboring distinct expectancy-value beliefs from domain to domain as a result of their experiences with different domains in the school context and the feedback they received about their performances (Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006). According to Moller and Marsh (2013), the comparisons between contrasting domains (e.g., math and English)

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result in contrast effects, meaning students who have high expectancy beliefs in math may well have low expectancy beliefs in English; whereas those between similar or close domains (e.g., math and science) can lead to similar effects, suggesting that students who value math may likely value science as well. However, it is unknown how the comparisons between a typical academic subject and a diversity education class play out in students' EV beliefs. Given the domain specific nature of EV theory, it is critical to explore students' EV beliefs to improve student motivation in diversity education. In particular, students may have motivation beliefs about a diversity course that could be very different from those about an academic subject (Worrell, 2014). For an instance, minority students may have minimal motivation to excel in an academic subject due to stereotype threat (Steele, 1997; Walton & Spencer, 2009; Worrell, 2014), but they may highly value a diversity course as they learn how their cultural identities influence their academic achievement and how their learning of various diversity issues can contribute to dissipating the myth of the well-known achievement gap (White & Worrell, 2012; Worrell, 2007; 2014).

Empirical EV Research and Models

As a motivational approach to education, expectancy and value beliefs have been widely used in a variety of disciplines such as STEM education (Abraham & Barker, 2015; Andersen & Ward, 2014), music education (McCormick & McPherson, 2007; Wigfield, 1997), physical education (Guo, Lee, & Harrison, 2008; Zhu, Sun, Chen, & Ennis, 2012), K-12 education particularly in math, English and reading literacy (Durik, Vida, & Eccles., 2006), and gifted education (Rodgers, 2008). Expectancy beliefs have been shown to predict student enrollment (Abraham & Barker, 2015) and STEM persistence (Andersen & Ward, 2014), while task value beliefs mostly predicted choice-making (Durik et al., 2006; Guo, Parker, Marsh, & Morin, 2015)

and career plans (Jones, Paretti, Hein, & Knott, 2010; Lauermann, Tsai, & Eccles, 2017). However, despite the important role of EV theory in a wide range of fields, there has been a gap between EV theory and diversity education due to several factors.

First, there has been a discrepancy between the EV theoretical framework and empirical models, as was documented in previous psychometric studies (McCormick & McPherson, 2007; Trautwein et al., 2012). Although conceptually different, task values tend to converge in certain subjects in empirical studies (Durik et al., 2006). Further, in one study (Au, 2006), only interest and utility values were found to fit a sample population, hence failure to support the theoretical EV structure. Second, much of the EV empirical research only focused on three of the task values while leaving out cost (Eccles et al., 1983). Most existing EV instruments had only two items on cost subscale or none (Trautwein et al., 2012; Wigfield & Eccles, 2000). To fill the gap, Flake et al. (2015) developed an instrument to measure cost. However, it is unknown how cost would fit in an inclusive instrument as a subscale in line with the EV theoretical framework. Third, as EV theory is domain-specific (Wigfield & Eccles, 2000), it is unclear whether the existing instruments measuring expectancy and value beliefs in other disciplines such as math (Lauermann et al., 2017) and reading (Wigfield, 1997) would translate to diversity education, a distinct discipline essential to an increasingly diverse society (Banks, 1981, 2004). As expectancies for success, and various task values are domain-specific and vary in disciplines (Durik et al., 2006; Wigfield, 1997), it merits research to examine the underlying empirical structure of EV theory in diversity education.

Despite fruitful research efforts of EV theory and instrumentation in disciplines including math and English etc. (Eccles et al., 1983; Wigfield & Eccles, 2000), the underlying structure of EV theory in diversity education is unknown due to its domain-specific nature (Wigfield, 1997).

Therefore, the purpose of the study was to explore the underlying structure of EV theory in diversity education. In particular, two widely used EV instruments from math and English subjects were adapted and compared through separate exploratory factor analyses results in the context of diversity education.

Method

Data sources

Participants included 254 students at a southeastern comprehensive university who voluntarily participated in the study to receive course credit, including 220 education majors and 34 non-education majors. The sample was predominantly White (60.1%), female (76.4%), and had English as their native language (90.6%). Most of them were from medium-to-large sized hometowns with a population of 10,000 residents or more (70.9%) and received at least three credit hours of instruction on diversity issues in education at the time of participation (88.4%). Their ages ranged from 17 to 72 years old ($M = 27.91$, $SD = 10.75$).

Procedure and Measures

Participants were asked to respond to a survey packet about their expectancy and value beliefs about student diversity. Additionally, participants were surveyed about their demographic information including their age, gender, hours of instruction received on diversity issues in education, and their hometown size, etc. IRB guidelines were strictly followed.

The Expectancy-Value Scale (EVS) was composed of 20 items on a 7-point Likert scale ranging from not true of me (1) to extremely true of me (7) with five subscales in line with EV theory adapted from a previously published instrument for math and English (Trautwein et al., 2012). Wordings were replaced accordingly to reflect the domain of diversity education. For example, a sample item of English expectancy beliefs "I have difficulty understanding

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everything to do in English" was revised into "I have difficulty understanding people from different cultures", and an original utility value sample item of "I'll need good mathematics/English skills for my later life" was reworded into "I'll need multicultural proficiency for my later life including my career".

The Expectancy-Value Inventory (EVI) was the other instrument used to measure participants' expectancy and value beliefs in multiculturalism on a 7-point Likert scale ranging from very much so (1) to not at all (7), which was adapted from two scales that were designed to measure students' expectancy and value beliefs in math (Wigfield, 1994; Wigfield & Eccles, 2000). Similarly, all 22 items were revised to match the domain of diversity education. For example, an original sample item about utility value in math "How useful is math to you?" was reworded into "How useful is taking a diversity course to you?" to reflect the students' perceived utility value in diversity education.

<div align="center">Results</div>

Separate exploratory factor analyses (EFA) were performed on the two instruments using SPSS 25 via principal axis factor extraction procedure with a direct oblimin rotation with delta set at 0 because extracted factors might be correlated (Gorsuch, 1983), due to the high correlations among the task values found in previous studies (Trautwein et al 2012). The three primary criteria used to determine the number of factors to extract were eigenvalues, the scree plot, and parallel analysis (Fabrigar & Wegener, 2011; Horn, 1965).

EFA Results of EVS

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .94, indicating that the data were appropriate for factor analysis (Gorsuch, 1983). Bartlett's test of sphericity led to the rejection of the null hypothesis ($p < .01$) that the correlation matrix was an identity matrix.

Before the rotation, two eigenvalues were found to be greater than 1.00 (10.01 and 2.80).

According to Costello and Osbourn (2005), retaining factors with eigenvalues over 1.00 is the

default in most statistical software packages including SPSS but usually produces too many

factors. Using the procedures of parallel analysis recommended by O'Connor (2000), mean and

95% eigenvalues were computed from a factor analysis of 1000 random data sets generated from

the same rank as the original data. Four eigenvalues from the original data set for a specific

factor were greater than the eigenvalues computed from the random data sets, suggesting four

factors should be retained (Thompson, 2004). However, because parallel analyses tend to

indicate more factors than warranted (Buja & Eyuboglu, 1992), additional procedures were used

to trim trivial factors. Following the oblimin rotation, the scree test suggested two factors that

respectively accounted for 50.04% and 14.01% (prerotation) for a total of 64.05% of the

variance. As a result, a two-factor solution was achieved and deemed more appropriate. All items

from the original scale loaded cleanly on either of the two factors (factor loadings > .40) without

cross loadings. The individual items retained in the model and factor loadings are presented in

Table 1.

Table 1.
Exploratory Factor Analysis Results of the Expectancy-Value Scale (N=254)

Item #	Statements	I P	I S	II P	II S	h^2
EXB1	I am good at interacting with people from different cultures.	**.75**	**.74**	-.14	-.10	.56
EXB 2	I have difficulty understanding people from different cultures. [R]	.15	.11	**-.71**	**-.70**	.52
EXB 3	I have always been good at cross-cultural communications.	**.58**	**.58**	-.01	.02	.34
EXB 4	I am never good at communicating with people from different cultures. [R]	.13	.09	**-.77**	**-.76**	.60
AVB1	I am really keen to learn a lot in multicultural issues.	**.84**	**.84**	.01	.06	.71
AVB 2	Diversity issues are important to me personally.	**.82**	**.82**	-.02	.04	.67
AVB 3	It is important to me personally to be proficient in cross-cultural communications.	**.89**	**.88**	-.03	.02	.78
IVB1	I enjoy learning about human diversity.	**.87**	**.86**	-.10	-.04	.75
IVB 2	I would like to take more classes on human diversity.	**.81**	**.82**	.10	.14	.67
IVB 3	When I am working on a diversity project, I sometimes don't notice time passing.	**.61**	**.63**	.29	.32	.48
IVB 4	I always look forward to diversity classes.	**.84**	**.85**	.13	.18	.74
IVB 5	If I can learn something new in human diversity, I am prepared to use my free time to do so.	**.84**	**.84**	.08	.13	.72
UVB1	I'll need multicultural proficiency for my later life including my career.	**.79**	**.78**	-.07	-.02	.62
UVB 2	Good grades in diversity classes can be of great value to me later.	**.75**	**.75**	-.02	.06	.56
UVB 3	I think I'll be able to use what I learn about human diversity in other settings.	**.86**	**.85**	-.08		.73
UVB 4	I think it is useful to learn about human diversity.	**.84**	**.83**	-.08	-.03	.70
CSB1	I'd have to sacrifice a lot of free time to be good at cross-cultural communications.	.08	.12	**.63**	**.63**	.41
CSB 2	I'd have to invest a lot of time to get good grades in diversity courses.	.27	.30	**.54**	**.56**	.38
CSB 3	The amount of effort it will take to be good at cross-cultural communications is worthwhile to me.[R]	**-.83**	**-.83**	.02	-.04	.69
CSB 4	The amount of time I spend on learning about human diversity keeps me from doing other things I would like to do.	-.03	.00	**.59**	**.58**	.34
	Eigenvalue	10.01		2.80		
	Percentage of Variance	48.37		11.38		
	Rotation Sum of Squared Loading	9.67		2.32		
	M (SD)	5.02(1.10)		3.07(1.24)		
	Reliability (Cronbach's Alpha)	.93		.78		

Note. Coefficients with values of .40 or greater are bolded. [R]=reverse coding; EXB=expectancy beliefs; AVB=attainment value beliefs; IVB=intrinsic value beliefs; UVB=utility value beliefs; CSB=cost beliefs; h^2=communalities; S=structure coefficients; I=Value; II=Cost.

Each factor was then interpreted by examining the item content and both structure and pattern coefficients. A total of 15 items loaded on Factor 1 (*Value*) including three of the task values from the original model as well as the expectancy dimension, which in general demonstrates the value of diversity education as perceived by the participants. Five items loaded on Factor 2 (*Cost*) resulting from the cost as well as the expectancy subscales from the original EV model, specifically focusing on the challenges and efforts students have to make in the process of diversity education. The internal consistency coefficients and 95% confidence intervals for the two factors were: Value (=. 93.) [.91, .94], and Cost (=. 78) [.73, .82], indicating high reliability of the two factors. The two factors had very low and insignificant correlations: $r = .06$, $> .05$.

EFA Results of EVI

The Kaiser-Meyer-Olkin (KMO) value was .96, indicating the appropriateness for factor analysis (Gorsuch, 1983). Bartlett's test of sphericity led to the rejection of the null hypothesis (p < .01). Before the oblimin rotation, three eigenvalues were found to be greater than 1.00 (14.07, 1.99, and 1.17). The parallel analysis procedure suggested three factors should be retained (Thompson, 2004). However, only one item loaded on the third factor and it cross-loaded on the first factor with a greater coefficient. The scree plot suggested two factors accounting for 63.96% and 9.05% (prerotation) for a total of 73.01% of the variance. Therefore, a two-factor solution was deemed more appropriate and parsimonious. The final factor solutions are presented in Table 2

Table 2

Exploratory Factor Analysis Results of the Expectancy-Value Inventory (N=254)

Item#	Item Content	I		II		h^2
		P	S	P	S	
EXP1	How competent do you expect to be in interacting people from diverse cultures?	**.86**	**.87**	.08	.18	.75
EXP2	How knowledgeable do you expect to be in interacting people from diverse cultures?	**.81**	**.82**	.08	.18	.67
EXP3	How confident do you expect to be in interacting people from diverse cultures?	**.82**	**.83**	.01	.12	.68
EXP4	How competent do you expect to be in confronting diversity-related prejudice and discriminatory behaviors?	**.75**	**.76**	.06	.16	.58
ATV1	How important do you find in interacting people from diverse cultures?	**.91**	**.90**	-.08	.04	.82
ATV2	How important do you find in becoming more knowledgeable in interacting people from diverse cultures?	**.91**	**.90**	-.13	-.02	.82
ATV3	How important do you find in feeling positive about human diversity?	**.89**	**.89**	-.03	.08	.78
ATV4	Some people find what they learn in one activity more important than what they learn in another. Compared to most of your other activities, how important is it to learn about diversity issues?	**.83**	**.85**	.12	.23	.73
INV1	How enjoyable is taking a diversity course to you?	**.86**	**.87**	.12	.22	.78
INV2	How enjoyable is interacting with people from different cultures?	**.82**	**.80**	-.14	-.03	.66
INV3	How enjoyable is learning about human diversity?	**.91**	**.91**	.01	.12	.82
INV4	How interesting is taking a diversity course to you?	**.82**	**.83**	.12	.22	.71
INV5	How interesting is interacting with people from different cultures?	**.81**	**.79**	-.17	-.06	.65
INV6	How interesting is learning about human diversity?	**.91**	**.91**	-.02	.10	.83
UTV1	How useful is taking a diversity course to you?	**.81**	**.82**	.09	.19	.69
UTV2	How useful is interacting with people from different cultures?	**.86**	**.84**	-.12	-.01	.73
UTV3	How useful is learning about human diversity?	**.90**	**.90**	-.03	.09	.81
UTV4	Some things that you learn in school help you to do things better outside class-that is, they are useful. For example, learning about plants might help you to grow a garden. In general, how useful is what you learn in diversity courses?	**.84**	**.85**	.05	.15	.72
CST1	How much does the amount of time you spend on learning about human diversity keep you from doing other things you would like to do?	-.06	.02	**.64**	**.64**	.41
CST2	How much is the amount of effort it will take to be proficient in cross-cultural communications worthwhile to you?	**.83**	**.84**	.04	.14	.70
CST3	How difficult is it to overcome negative emotions such as anxiety and frustrations in learning about diversity issues in society?	.08	.14	**.49**	**.50**	.25
CST4	How much does learning about diversity issues generate negative affective memories of your earlier experiences that you want to avoid?	-.01	.09	**.88**	**.88**	.77
	Eigenvalue	14.07		1.99		
	Percentage of Variance	63.96		9.05		
	Rotation Sum of Squared Loading	13.81		1.80		
	M (SD)	5.77(1.14)		3.88(1.54)		
	Reliability (Cronbach's Alpha)	.98		.72		

Note. EXP=expectancy; ATV=attainment value; INV=intrinsic value; UTV=utility value; CST=cost; P=pattern coefficients; S=structure coefficients; I=Value; II=Cost; h^2=communalities; Coefficients with values of .40 or greater are bolded.

Of the 19 items that loaded on Factor 1 (*Value*), most related to three of the task values from the original model that represents participants' perceived value of diversity education. Three items loaded on Factor 2 (*Cost*), all of which came from the original cost subscale, specifically focusing on the physical as well as emotional efforts students have to make in the process of diversity education. The internal consistency coefficients and 95% confidence intervals for the two factors were: Value (= .98) [.98, .98], and Cost (= .72) [.65, .78], indicating high reliability of the two factors. Similar to EFA results of EVS, the two factors were not correlated: $r = .12$, > .05.

Discussion

The purpose of this study was to examine the underlying structure of EV theory in diversity education by exploring and comparing the factor structures of two instruments adapted from the existing prevalent scales (Trautwein et al., 2012; Wigfield, 1994; Wigfield & Eccles, 2000) based on modern EV theory. The findings of the current study are of important psychometric value, in that only when we find out the underlying structure of EV theory in diversity education, will we be able to utilize EV theory to motivate student learning in diversity education. Although EV theory posits five dimensions, including expectancy of success, intrinsic value, attainment value, utility value and cost, the EFA results of both instruments adopted in the study suggests a two-factor model may be more appropriate in diversity education.

The two-factor models of EVS and EVI bear similarity despite minor differences. First, the 15 items defining *value* on EVS included two items from the original *expectancy* subscale, all items from the *attainment* and *utility values* subscales, and unexpectedly, one from the original *cost* subscale (Table 1). A closer examination of the item revealed its value nature with the word "worthwhile" despite its overall content focus of cost. Similarly, the 19 items defining *value* on

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EVI included all items from the original subscales of *expectancy, attainment, intrinsic*, and *utility* values, and unexpectedly, one item from *cost* (Table 2). A closer look at the item "How much is the amount of effort it will take to be proficient in cross-cultural communications worthwhile to you?" reveals the "value" nature of the item with the word "worthwhile" despite its intent of a cost item with the focus on "effort". The fact that all items from the original *utility* and *attainment* value subscales loaded on one value factor in both EFA results not only speaks to the high factor correlations of different task values found in another study (Trautwein et al., 2012), but also testifies to the domain-specific nature of EV theory. As Durik et al., (2006) maintained that a reader's utility and attainment values have the capacity to converge within a reading task despite their conceptual distinction, so did they have the capacity to converge in learning about human diversity.

The EFA results of both instruments substantiated value as a major motivating factor in diversity education, echoing previous studies highlighting the value of diversity education (Cole, Case, Rios, & Curtin, 2011; Jackson, 1999). In a study involving 173 first-semester students, Cole et al. (2011) found that students taking diversity courses were more aware of white privilege and less likely to deny the existence of blatant racism at the end of a semester than those in a comparison course that was not diversity related. Similarly, Jackson (1999) suggested that diversity courses have the potential to reinforce an active learning process for both faculty and students and to help develop self-awareness and better understand people's complex experiences with oppression.

Second, both EFA results revealed *cost* as the other essential motivating factor in diversity education. While all the three items in EVI that loaded on the cost factor were derived from the original cost subscale, the five items in EVS that loaded on the cost factor included not

only three items from the original cost subscale, but also two items from the expectancy subscale focusing on the difficulty and efficacy beliefs in cross-cultural communication. The result provided preliminary support for the conceptualization of different types of costs such as emotional cost versus the cost of what is given up due to engaging in a certain task (Flake, Barron, Hulleman, McCoach, & Welsh, 2015; Mosyjowski, Daly, Peters, Skerlos, & Baker, 2017). For example, a typical emotional cost for taking diversity courses is discomfort and anxiety students can experience when they are exposed to course materials that challenge their own beliefs, resulting in resistant behaviors among students (Jackson, 1999).

The discrepancy between the factor solution in the study and the five-dimension model of EV theory (Eccles et al., 1983; Wigfield & Eccles, 2000) may be a result of several elements. First, as Eccles and colleagues (1983) have argued, EV theory is domain specific. Analogous to the concept that what matters in math may be totally different from reading (Wigfield, 1997), what is valuable in learning about math or English may be very different from learning about human diversity. Since the effectiveness of diversity education is much harder to assess than learning outcomes in other disciplines, including math or English (Yang, 2018), expectancy of success in social interactions with diverse individuals is more elusive, hence less salient than the task values of learning about human diversity. Second, the current five-dimension EV model may have complicated the construct of motivation in diversity education. The five aspects of EV model are undoubtedly crucial in the motivational process of diversity education for an increasingly diverse society; however, they also seem to come down to the values attached to it and the prices students are willing to pay to achieve cultural competence. Understanding students' value and cost beliefs may help us identify the various emotional challenges students

experience in the course of diversity education (Chizhik & Chizhik, 2002; Howard, 2006; Wang, 2008) so as to better motivate students through providing needed support.

The more parsimonious fit of the two-factor model from both EFA results in the present study suggests that perhaps motivation for diversity education should be considered as a two-factor construct, value and cost. Therefore, rather than focusing on all the five dimensions of EV theory, it may be more beneficial for educators to focus on the value and cost of diversity education in developing a culturally responsive pedagogy, including providing support to help offset the cost (emotional cost, difficulty level, etc.) which may require a great deal of task effort or outside effort (Flake et al., 2015). Providing emotional support may be a critical way to help motivate diversity education, since diversity education inevitably involves overcoming negative emotions as one challenges one's own biases and beliefs, and revisits what has happened in history due to prejudice and discrimination.

Overall, the EFA results on both EVS and EVI produced a two-factor model compared to the five-dimensional model of EV theory proposed by Eccles and colleagues (Eccles et al., 1983; Wigfield & Eccles, 2000), suggesting a need for further psychometric studies of EV theory in a more simplified fashion in diversity education.

Limitations and Future Directions

The failure of both the Expectancy-Value Scale (EVS) and the Expectancy-Value Inventory (EVI) to support the EV model (Eccles et al., 1983) in the present study raised concerns about understanding and operationalizing expectancy and value beliefs in diversity education. The two-factor model from both EFA results suggests a less complicated, more straightforward, way for teacher educators to understand students' value and cost beliefs in diversity education. The cost and value factors found in the current study, if further refined, can

be useful for understanding students' value and cost beliefs in diversity education, hence better meeting the motivational needs of students taking diversity courses. More studies are needed before a definitive statement can be made about the underlying structure of modern EV theory in the context of diversity education. Further work confirming the underlying structure of EV theory and refining and assessing the reliability and validity of cost and value subscales, including confirmatory factor analyses of both EVS and EVI with new populations, represents an important next step in advancing their usefulness in other studies of diversity education and with more diverse student populations.

The discrepancy between the factor solutions of both the Expectancy-Value Scale (EVS) and the Expectancy-Value Inventory (EVI) suggests a need for future research efforts to develop a robust and representative instrument to capture the essence of students' value and cost beliefs in diversity education. In particular, perhaps the expectancy, attainment, utility, intrinsic value, and cost dimensions of both the EVS and EVI should be more substantiated by additional items to test whether these concepts are empirically distinguished. As Diuguid and Suzuki (2019) put it, "learning about differences should be a worthwhile and meaningful experience", delineating the value of diversity education, and "learning about differences requires patience, because many people often perceive this process as an uncomfortable experience," which reflects the cost associated with diversity education (p. 40). Based on the present study results, further research should uncover the specific types of values diversity education embodies, as well as what it takes to have an effective diversity education.

Last but not the least, since the present study is solely exploratory, future research should endeavor to test the two factors through confirmatory factor analyses and replicate to bigger samples before we can reach a definitive conclusion about the underlying structure of EV theory

in diversity education. Only when we can fully understand and capture students' value and cost

beliefs in diversity education, will we be better able to help students reap the benefits of diversity

education and motivate them in the learning process.

Conclusion

This study was among the first to explore the underlying structure of EV theory in

diversity education. The EFA findings on both instruments produced a two-factor solution

compared to the five-dimensional models of EV theory proposed by Eccles et al. (1983). Despite

the discrepancy with the EV theoretical model, the EFA results in the study provided partial

conceptual support of EV theory into two distinct factors: *Value* and *Cost*, which is consistent

with the tenets of the theory that the positive (value) and negative (cost) task characteristics are

primary motivating factors (Eccles & Wigfield, 2002). While diversity education can be

perceived with great value (Cole et al., 2011), the cost that comes with it may be a deterring

factor (Jackson, 1999). Understanding students' value and cost beliefs in diversity education will

better equip educators in highlighting the benefits of diversity education and providing

scaffolding to students in the difficult learning process that is challenging and emotionally

charging. Resonating with previous results (Yang & Mindrila, 2018; McCormick & McPherson,

2007; Trautwein et al., 2012), the findings in the current study suggest a need for further

psychometric research replicated to larger and more diverse samples to develop and validate EV

instruments in diversity education in an attempt to enhance the motivation and effectiveness of

diversity education for a more diverse and equitable society.

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