Brief Note

Causal Analysis of Attitude Formation Towards Persons With Intellectual Disabilities

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The purpose of the present study was to clarify causal relations among latent variables (constructs) obtained from implementing exploratory factor analysis and cluster analysis. We applied an analysis of covariance structure to the causal model of attitudes towards persons with intellectual disabilities. The participants, 415 university students, completed a survey composed of 28 items related to attitudes towards persons with intellectual disabilities, 12 items concerning relations with children (persons) with intellectual disabilities during the respondents' elementary and middle school years, 8 items concerning participants' attributes, and a free-answer question. Significant causal coefficients were obtained among the respective latent variables. The main results were as follows: Experience in integrated education during elementary school was not necessarily positively utilized in attitudes formation. Talking at home about children with intellectual disabilities had a positive influence on attitude formation. Affirmation of the abilities of persons with intellectual disabilities had more positive influence. Volunteer work and discussion related to persons with intellectual disabilities after middle school graduation were utilized positively in attitude formation.

Key Words: intellectual disabilities, attitude formation, causal analysis, analysis of covariance structure

Introduction

Published research suggests that the structure of attitudes towards persons with intellectual disabilities is complex, multi-component, and multidimensional (Antonak & Livneh, 1991; Harth, 1974). Previous studies that conducted exploratory factor analysis (EFA) clarified the multidimensionality of attitude structures. Further, consideration was given to the relation between attitude factors and variables such as gender, contact with persons with intellectual disabilities, and knowledge of intellectual disabilities. However, past research did not refer to causal relationships among the various primary factors and extracted factors.

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In thinking about attitude structures towards persons with intellectual disabilities, it is hypothesized that multiple causes intertwine to influence multiple attitude dimensions in various forms.

The limits of exploratory factor analysis have been pointed out since 1990, particularly: (1) because the goal of factor analysis is conducting shortened descriptions, it cannot handle causal relationships among the constructs (factors), and (2) it is impossible to reflect clear data properties to the model before analysis, or to display measurement designs (Toyoda, 1992). On the other hand, the advantages of the analysis of covariance structure have been pointed out, that is, it enables analysis of causal relationships among factors and comparison of relative strengths of multiple causal models (Kano & Miura, 2002).

Up to now, the present authors have conducted research on attitudes using exploratory factor analysis to extract various factors, such as practical goodwill, affirmation of ability, acceptance of integration in the community, acceptance of participation in society, acceptance of integration in the classroom, and ideal goodwill (Narukawa, 1995). In addition, a causal relationship among these extracted factors (latent variables) was investigated by applying an analysis of covariance structure (Narukawa & Maekawa, 2004). As a result, it was possible to consider causal relationships among four or five latent variables (constructs), and thus conduct an even deeper analysis of the results obtained using exploratory factor analysis. However, the authors have reconsidered two of their attitude studies, conducted within their causal analysis research (Narukawa & Maekawa, 2004), reusing data that had already been analyzed. Consequently, the model was constructed after data collection, and factors (constructs) causally related to contact experiences, which are likely to influence attitude formation, were not incorporated in the model. Although we were able to make some inferences about causal relations among the constructs, we were unable to elucidate the kinds of factors that might affect constructs such as practical goodwill, acceptance of integration in the community, and affirmation of ability.

Contact with children with intellectual disabilities during childhood play is probably frequent. It has been shown that direct contact through play has a positive influence on attitudes towards persons with intellectual disabilities (Narukawa, 1993). Moreover, according to Yamaguchi (1969), in cases in which children with intellectual disabilities from special education classes participate in school events and activities together with children without disabilities, and are given roles acceptable to the children without disabilities, the children without disabilities were favorable towards children with intellectual disabilities. On the other hand, when children with intellectual disabilities from special education classes did not participate in school events and activities, and played no role in the school, the children without disabilities were more unfavorable towards children with intellectual disabilities than were children without disabilities from schools with no special education program. Additionally, research has shown that receptive attitudes towards children with disabilities are more prevalent at schools in which there is an organized effort to promote mutual
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exchange between children with and without disabilities, as compared to schools in which no such effort is made (Voeltz, 1980).

It is also possible that exchange with children with disabilities affects family conversations. The results of Uetani’s (1992) survey of middle school students show that talking about persons with disabilities is more frequent in the homes of students whose schools conduct exchanges with schools for students with physical disabilities, compared to students whose schools have no such exchanges.

In the present study, an analysis of covariance structure was applied to data on attitudes towards persons with intellectual disabilities. In the analysis, the latent variables are the unobserved variables, constructs, or factors measured by their respective indicators. The observed variables are indicators, sometimes called manifest variables or reference variables, such as items in a survey instrument.

In the present study, the latent variables of attitudes include acceptance of integration in the classroom, affirmation of ability, ideal goodwill, practical goodwill. The latent variables of experiences include integrated education experiences during elementary school, contact experiences with children with intellectual disabilities and talking at home about persons with intellectual disabilities during elementary/middle school years, and later volunteer experiences.

The purpose of the present study is to explore the influence of the latent variables of experience on the latent variables of attitude towards persons with intellectual disabilities. An additional purpose is to clarify causal relations among the latent variables of experience and the causal relations among the latent variables of attitude.

Method

Survey Details

The survey was composed of 28 items related to attitudes towards local lifestyles, education, persons with intellectual disabilities in the workplace, activities directed at children (persons) with intellectual disabilities, and others; 8 items concerning relations with children (persons) with intellectual disabilities during elementary school years; 4 items concerning relations with children (persons) with intellectual disabilities during middle school years; 8 items concerning participant attributes, such as gender, age, contact experiences with persons with intellectual disabilities and volunteer experiences; and a free-answer question.

The 28 items related to attitudes were based on items used in scaling the authors’ previous research surveys (Narukawa, 1995; Narukawa, & Nasu, 2002). In questions beginning with “Do you think...?” a range of 5 choices was given: (1) I think so strongly, (2) I think so, (3) Can’t say, (4) I don’t think so, and (5) I don’t think so at all. In questions beginning with “Do you feel that...?” a range of 5 choices was given: (1) I feel this way strongly, (2) I feel this way, (3) Can’t say, (4) I don’t feel this way, (5) I don’t feel this way at all. The 12 items related to relations with children (persons) with intellectual disabilities during participants’ elementary and middle school years
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inquired into experiences with integrated education during elementary school, experiences with playing with or talking to children with intellectual disabilities during elementary and middle school years, and experiences with family conversations regarding disabled persons. In regards to questions beginning with “Did you play...?”, a range of 5 choices was given: (1) Very often, (2) Often, (3) Sometimes, (4) A little, (5) Not at all. In regard to questions beginning with “Did you ever talk about...?”, a range of 5 choices was given: (1) Yes, often, (2) Yes, (3) A little, (4) Not very often, (5) No, not at all. With regard to processing the numbers, participants’ answers were converted to scores by reversing the numerical values. For example, “I think so strongly” was scored as 5, while “I don’t think so at all” was scored as 1; “Very often” was 5, while “Not at all” was 1.

With regard to items concerned with attributes of the survey participants, five choices, ranging from “Not at all” to “Very frequently” were given for the question, “Do you ever talk about persons with intellectual disabilities in your daily conversations?” In this case, “Not at all” was scored as 1, while “Very frequently” was 5. Regarding the amount of volunteer work done with persons with intellectual disabilities, no experience was scored as 0, 1 or 2 times as 1, 3 or 4 times as 2, 5 or 6 times as 3, and 7 or more times as 4.

**Research Participants and Survey Period**

Participants were 415 students at T University who consented to answer the survey. Their age ranged from 18 to 22; of the 415, 180 were male, 235 female.

The survey period was early November 2003 through mid-December 2003.

**Analysis Methods**

Exploratory factor analysis was conducted on the 415 data sets with respect to the 28 items related to attitudes towards persons with intellectual disabilities. Cluster analysis was also performed on the 12 items concerning relations. From these results, latent variables were determined, in order to create a causal model. After the latent variables were determined, a causal model was constructed based on a hypothesis. The model was verified by applying an analysis of covariance structure to the constructed causal model. While verifying the model, in cases where the path coefficient between latent variables was small, that path was deleted. In this way, the model’s accuracy was refined, while referring to modification indexes. SPSS 11.5 and Amos 4.0 were used in conducting this analysis.

The various effect indicators from the latent variables towards observed variables were calculated, and the validity of each latent variable was considered. Also, the strength of causal relationships was considered, referring to the value of the path coefficients among the latent variables.

In evaluating the models, emphasis was placed on the use of: the results of the following: chi-square test, Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Akaike Information Criterion (AIC), and Root Mean Square Error of Approximation (RMSEA).  

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Results and Interpretation

Exploratory Factor Analysis and Cluster Analysis

Factor analysis (principal factor analysis; Promax rotation) was undertaken on the 28 items concerning attitudes. Five factors were extracted, based on the simple structure and feasibility of factor interpretation, while paying attention to factor pattern coefficients with values of 0.500 and above in the factor pattern matrix. Before rotation, the cumulative contribution rate of the 5 factors was 50.9%.

Factor I exhibited large factor pattern coefficients for items related to practical goodwill, such as a desire to perform volunteer work for persons with intellectual disabilities, a desire to have contact with them, and a desire to become friends with them. Factor I was named “practical goodwill”.

Factor II had high factor pattern coefficients for items related to affirmation of ability, such as whether guidance is effective for children with intellectual disabilities, and whether persons with intellectual disabilities will acquire the abilities necessary for everyday life. Thus, Factor II was named “affirmation of ability”.

Factor III exhibited large factor pattern coefficients for items related to the integrated education of children with and without intellectual disabilities, such as whether children with intellectual disabilities can study together with other children, and whether they can be sufficiently educated together with other children. Therefore, Factor III was named “acceptance of integration in the classroom”.

Factor IV had high factor pattern coefficients for items related to ideal or general goodwill, such as whether the local environment should be made more livable for persons with intellectual disabilities, and whether the government should work more to provide employment for them. Factor IV was named “ideal goodwill”.

Factor V had large factor pattern coefficients for items related to feelings of resistance to working together with persons with intellectual disabilities, feelings of resistance to the existence of workplaces for persons with intellectual disabilities nearby, and feelings of resistance to persons with intellectual disabilities living nearby. Thus, factor V was named “feelings of resistance”.

Of the above 5 factors, four correspond to factors that were extracted in the authors’ previous studies (Narukawa, 1995; Narukawa, & Nasu, 2002): “practical goodwill”, “affirmation of ability”, “acceptance of integration in the classroom,” and “ideal goodwill”.

Next, cluster analysis (the method of Average Linkage Between Groups) was conducted to classify 12 items concerning relations with children (persons) with intellectual disabilities during elementary/middle school years.

Looking at the result of cluster analysis, 12 items were divided into the following four categories: (1) Item 33 and item 34 (elementary school integration) related to items concerning integrated education during elementary school. (2) Item 32 and item 36 (elementary school contact) related to items concerning contact during elementary school. (3) Item 40 and item 41 (middle school contact) related to items concerning
contact during middle school. (4) Item 38 and item 42 (family conversations) related to items concerning conversations at respondents' homes about persons with intellectual disabilities.

The above results were used to compose latent variables.

**Construction of the Causal Model**

Based on the results of the exploratory factor analysis conducted on the 28 attitude items, five latent variables were created: "practical goodwill," "affirmation of ability," "acceptance of integration in the classroom," "ideal goodwill," and "feelings of resistance". Further, from the results of the cluster analysis on items concerned with elementary and middle school years, four latent variables were created: "elementary school integration," "elementary school contact," "middle school contact," and "family conversations." Further, a "practical action" latent variable was created from attribute items, namely, the question regarding talking about persons with intellectual disabilities in daily conversations (item 43) and the question regarding amount of volunteer work with persons with intellectual disabilities (item 44). Hypotheses on the association among these ten latent variables are: (1) "Elementary school integration," "elementary school contact," and "family conversations" probably influence "middle school contact." (2) "Elementary school integration," "elementary school contact," "middle school contact," and "family conversations" probably influence "feelings of resistance," "affirmation of ability," "acceptance of integration in the classroom," and "ideal goodwill." (3) "Affirmation of ability" probably influences "acceptance of integration in the classroom," "feelings of resistance," and "ideal goodwill." (4) "Ideal goodwill" probably influences "practical goodwill" and "practical action." (5) "Practical goodwill" probably influences "practical action." (6) "Practical action" probably influences "affirmation of ability." The causal model of attitude formation shown in Fig. 1 was constructed by combining these hypotheses.

**Verification of the Causal Model of Attitude Formation**

The causal model that was constructed was verified by applying analysis of covariance structure. The maximum likelihood method was used in assuming parameters in the analysis. In verifying the model, we attempted to make it more relevant by deleting paths in which path coefficients among latent variables were small and not significant, and further by adding paths, referring to modification indexes, adding covariance between error variables, and by eliminating observed variables.

As the observed variables of the five latent variables related to attitude items, the focus was placed on those for which factor analysis produced factor pattern coefficients of 0.50 and above, those with high path coefficients (effect indicators) from the latent variable, and those in which the factor name and details were directly connected.

The observed variables related to "practical goodwill" were composed of items 8, 17 and 27. These items are concerned with volunteer work on behalf of persons with intellectual disabilities and contact with them. Items 18, 19 and 24 were used for

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the observed variables of “affirmation of ability”. The details of all of these affirm the abilities of children (persons) with intellectual disabilities.

Items 3, 9 and 13, which had large factor pattern coefficients, were used for the observed variable of “acceptance of integration in the classroom”. These items related to the attitude that children with intellectual disabilities can be educated in regular classroom instruction. The observed variables of “ideal goodwill” were items 1 and 2, which had large factor pattern coefficients. These items related to the general attitude that the local environment should be improved for the sake of persons with intellectual disabilities.

Items 14, 16 and 25 were related to the observed variables of “feelings of resistance”. All of these items concerned with feelings of resistance towards problems related to intellectual disabilities.

With regards to 12 items concerning relations with children (persons) with intellectual disabilities, observed variables were determined from the results of cluster analysis. Items 33 and 34 were used as observed variables for “elementary school integration”. Items 32 and 36 were used as observed variables for “elementary school contact”; items 40 and 41, as observed variables for “middle school contact”; and items 38 and 42 for “family conversations”. Further, items 43 and 44 were used as observed variables for “practical action”.

The above 10 latent variables and 24 observed variables are shown in Table 1. These variables were used in the analysis of the causal model concerning attitudes towards persons with intellectual disabilities. Analysis of covariance structure was conducted on the path diagram (causal model of attitude formation) shown in Fig. 1. Insignificant paths were sequentially deleted throughout. Furthermore, paths from

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**FIG. 1** The Causal Model of Attitude Formation

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TABLE 1 Latent Variables and Their Observed Variables Used in Analysis of Covariance Structure, and Mean and Standard Deviation of Observed Variables

<table>
<thead>
<tr>
<th>Latent Variables</th>
<th>Observed Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical Goodwill</td>
<td>8. Do you want to participate in volunteer work on behalf of persons with intellectual disabilities?</td>
<td>3.36</td>
<td>0.91</td>
</tr>
<tr>
<td></td>
<td>17. Do you want to have contact with persons with intellectual disabilities?</td>
<td>3.14</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>27. Do you want to become friends with persons with intellectual disabilities?</td>
<td>3.22</td>
<td>0.74</td>
</tr>
<tr>
<td>Affirmation of Ability</td>
<td>18. Do you think it effective to provide guidance to children with intellectual disabilities?</td>
<td>3.94</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>19. Do you think persons with intellectual disabilities can learn the skills they need to live?</td>
<td>3.95</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>24. Do you think persons with intellectual disabilities can perform a variety of work?</td>
<td>3.75</td>
<td>0.73</td>
</tr>
<tr>
<td>Acceptance of Integration in the Classroom</td>
<td>3. Do you think children with intellectual disabilities can be sufficiently educated with other children in the regular classroom?</td>
<td>2.98</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>9. Do you think children with intellectual disabilities can study together with other children in the regular classroom?</td>
<td>3.07</td>
<td>0.91</td>
</tr>
<tr>
<td></td>
<td>13. Do you think that for children with intellectual disabilities, it is to their advantage to attend usual grade levels?</td>
<td>3.11</td>
<td>0.76</td>
</tr>
<tr>
<td>Ideal Goodwill</td>
<td>1. Do you think that the local environment should be made more habitable for persons with intellectual disabilities?</td>
<td>4.30</td>
<td>0.66</td>
</tr>
<tr>
<td></td>
<td>2. Do you think the nation should work harder to employ persons with intellectual disabilities?</td>
<td>4.22</td>
<td>0.73</td>
</tr>
<tr>
<td>Feelings of Resistance</td>
<td>14. Would you feel reluctant to work together with persons with intellectual disabilities?</td>
<td>2.88</td>
<td>0.93</td>
</tr>
<tr>
<td></td>
<td>16. Are you resistant to the idea of having a workplace for persons with intellectual disabilities near your home?</td>
<td>2.45</td>
<td>0.97</td>
</tr>
<tr>
<td></td>
<td>25. Are you resistant to the idea of persons with intellectual disabilities living near your home?</td>
<td>2.58</td>
<td>0.97</td>
</tr>
<tr>
<td>Elementary School Integration</td>
<td>33. Did you ever take math, Japanese, science, or social studies classes with children with intellectual disabilities when you were in elementary school?</td>
<td>2.17</td>
<td>1.40</td>
</tr>
<tr>
<td></td>
<td>34. Did you ever take physical education, music, or art classes with children with intellectual disabilities when you were in elementary school?</td>
<td>2.28</td>
<td>1.43</td>
</tr>
<tr>
<td>Elementary School Contact</td>
<td>32. Did you ever play with children with intellectual disabilities at school or in your neighborhood when you were in elementary school?</td>
<td>2.24</td>
<td>1.22</td>
</tr>
<tr>
<td></td>
<td>36. Did you ever speak to children with intellectual disabilities at school or in your neighborhood when you were in elementary school?</td>
<td>2.43</td>
<td>1.22</td>
</tr>
<tr>
<td>Middle School Contact</td>
<td>40. Did you ever play with children with intellectual disabilities at school or in your neighborhood when you were in middle school?</td>
<td>1.50</td>
<td>0.91</td>
</tr>
<tr>
<td></td>
<td>41. Did you ever speak to children with intellectual disabilities at school or in your neighborhood when you were in middle school?</td>
<td>1.89</td>
<td>1.10</td>
</tr>
<tr>
<td>Family Conversations</td>
<td>38. Did you ever talk about persons with intellectual disabilities with your family when you were in elementary school?</td>
<td>2.25</td>
<td>1.14</td>
</tr>
<tr>
<td></td>
<td>42. Did you ever talk about persons with intellectual disabilities with your family when you were in middle school?</td>
<td>2.07</td>
<td>1.06</td>
</tr>
<tr>
<td>Practical Action</td>
<td>43. Do you ever talk about persons with intellectual disabilities in your daily conversations?</td>
<td>2.06</td>
<td>0.95</td>
</tr>
<tr>
<td></td>
<td>44. Amount of volunteer work with persons with intellectual disabilities.</td>
<td>1.50</td>
<td>0.93</td>
</tr>
</tbody>
</table>
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"elementary school contact" to "practical goodwill", and from "family conversations" to "practical goodwill" and "practical action" were added in consultation with modification indexes.

Results of analysis of the corrected model are shown in Fig. 2. The path coefficients among latent variables in the figure are all significant, with the exception of the significant difference trend ($p < .10$) in the coefficient of the path from "elementary school integration" to "affirmation of ability". In Fig. 2, there is a negative estimated value for the variance of the error variable $e34$ for observed variable item 34. Because the standardized estimated value for the effect indicator from "elementary school integration" to item 34 exceeded 1 (1.01), the value of $e34$'s variance was locked at 0 in conducting the analysis.

Looking at the values of the effect indicators from each latent variable to observed variables in Fig. 2, they are, in general, high, and each value is statistically significant at the 0.01 level. All effect indicators were 0.50 or more. Consequently, it can probably be said that the various observed variables are valid as indices that comprise the 10 latent variables.

Looking at the goodness of fit of the model, the chi-square test was significant ($p < .001$). The null hypothesis that it is a good fitting model is rejected. Looking at other indexes, the Goodness-of-Fit Index is 0.932, and the Adjusted Goodness-of-Fit Index is 0.911; both exceed 0.90. Further, the Root Mean Square Error of Approximation is 0.038, fulfilling the criterion of being below 0.05. Excluding the results of the chi-square test, the data and model can be accepted as being good fitting.

As for interpretable modification indexes, correlations were recognized in the

\[
\begin{align*}
GFI &= 0.932 \\
AGFI &= 0.911 \\
RMSEA &= 0.038 \\
AIC &= 510.209 \\
\chi^2 &= 368.209 (df=229) \\
p &= 0.000
\end{align*}
\]

**FIG. 2** Results of Analysis of Causal Model of Attitude Formation
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error terms between item 32 and item 41, error terms between “elementary school contact” and “family conversations”, and error terms between “acceptance of integration in the classroom” and practical goodwill”. Therefore, as in Fig. 2, the model was corrected by recognizing the various error correlations between these variables. As a result, the goodness of fit of the model to the data was improved.

**Values of Path Coefficients Among Latent Variables and Their Interpretations**

The path coefficient from “elementary school integration” to “elementary school contact” is relatively large at 0.60 (p<.01). It is likely that “elementary school integration” has a strong influence on “elementary school contact.” At 0.22, the path coefficient from “elementary school integration” to “family conversations” is not large, but it is statistically significant (p<.01). It is likely that integrated education in elementary school does affect conversations at home, although not greatly.

Path coefficients from “elementary school integration” to “affirmation of ability” and “ideal goodwill” are, respectively, −0.13 (p<.10) and −0.16 (p<.01), and a significant difference trend and significant difference were recognized. Since both values are negative, these indicate that integrated elementary school education has a small minus effect on affirmation of the abilities of persons with intellectual disabilities, and ideal goodwill towards them.

Path coefficients from “elementary school integration” to “middle school contact” and “acceptance of integration in the classroom” were not statistically significant. Thus, it cannot be said that experiencing integrated education in elementary school leads to acceptance of integrated education. Also, path coefficients from “elementary school integration” to “feelings of resistance” were not significant. It cannot be said that experiencing integrated education plays a role in diminishing feelings of resistance to persons with intellectual disabilities.

Path coefficients from “elementary school contact” to “middle school contact” were statistically significant (p<.01), at 0.38. It can be said that the experience of coming into contact with persons with intellectual disabilities during elementary school years affects contact during middle school years. Examining the path coefficient from “elementary school contact” to “practical goodwill”, it is 0.21; that value is statistically significant (p<.01). It can probably be said that contact experience in elementary school years has a good influence on practical goodwill. However, the path coefficient from “elementary school contact” to “ideal goodwill” is not statistically significant.

At 0.28, the path coefficient from “elementary school contact” to “affirmation of ability” is not large, but it is statistically significant (p<.01). It can probably be said that contact experience in elementary school years influences affirmation of the ability of people with intellectual disabilities.

The path coefficient from “elementary school contact” to “acceptance of integration in the classroom” was not significant. Thus, it cannot be said that contact with children with intellectual disabilities in elementary school leads to an attitude in later years of accepting integrated education. Also, the path coefficient from “elementary
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school contact" to "feelings of resistance" was not significant. Therefore, it cannot be said that contact during elementary school years plays a role in diminishing feelings of resistance towards persons with intellectual disabilities.

At 0.20, the path coefficient from "middle school contact" to "acceptance of integration in the classroom" is not large, but is statistically significant ($p<.01$). Consequently, this fact differs from "elementary school contact," in that contact during middle school years slightly affects attitudes of acceptance of integration in the classroom.

At $-0.17$, the path coefficient from "middle school contact" to "affirmation of ability" was significant ($p<.05$). Contact experience during middle school years has a slight negative impact on the affirmation of ability of persons with intellectual disabilities. The path coefficient from "middle school contact" to "feelings of resistance" was not statistically significant. Therefore, it cannot be said that contact during middle school years plays a role in diminishing feelings of resistance towards persons with intellectual disabilities. Also, the path coefficients from "middle school contact" to "ideal goodwill," "practical goodwill," and "practical action" were not statistically significant.

The path coefficient from "family conversations" to "practical action" was comparatively large at 0.48 ($p<.01$). Consequently, it can be said that the experience of talking at home about persons with intellectual disabilities during elementary and middle school years directly influences attitudes towards discussing persons with intellectual disabilities and/or doing volunteer work on their behalf in later years. The path coefficient from "family conversations" to "middle school contact" was significant at 0.39 ($p<.01$), so it is probable that talking at home about persons with intellectual disabilities influences contact with them. Further, the path coefficients from "family conversations" to "ideal goodwill" and "practical goodwill" were 0.12 and 0.16 respectively, making them small but statistically significant ($p<.05$).

The path coefficients from "family conversations" to "affirmation of ability," "acceptance of integration in the classroom," and "feelings of resistance" were not significant. Consequently, it can be said that the experience of talking at home about persons with intellectual disabilities does not directly influence attitudes of affirmation of the ability of persons with intellectual disabilities or acceptance of integration in the classroom, or play a role in diminishing feelings of resistance.

The path coefficient from "affirmation of ability" to "acceptance of integration in the classroom" was 0.28, making it statistically significant. Therefore, it can be said that affirmation of the ability of persons with intellectual disabilities influences attitudes related to acceptance of their integration in the classroom. Also, the path coefficient from "affirmation of ability" to "ideal goodwill" was 0.48, making it comparatively large and statistically significant ($p<.01$). However, the path coefficient to "practical goodwill" was not statistically significant. Therefore, while affirmation of the ability of persons with intellectual disabilities has a comparatively large influence on "ideal goodwill," it cannot be said to influence "practical goodwill" directly.
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The path coefficient from “practical action” to “affirmation of ability” was 0.26, making it statistically significant ($p<.01$). It can be said that discussing persons with intellectual disabilities and performing volunteer work on their behalf is linked with “affirmation of ability” of persons with intellectual disabilities.

The path coefficient from “affirmation of ability” to “feelings of resistance” was $-0.41$, making it statistically significant ($p<.01$), and thus can be said to exert a negative influence. In other words, affirmation of the ability of persons with intellectual disabilities plays a role in diminishing feelings of resistance towards persons with intellectual disabilities.

The path coefficient from “feelings of resistance” to “practical goodwill” was $-0.19$, making it small but statistically significant ($p<.01$). Consequently, it can be said that “feelings of resistance” to persons with intellectual disabilities have a weak negative influence on “practical goodwill”. This probably implies that having “feelings of resistance” towards persons with intellectual disabilities makes it difficult to have “practical goodwill” towards them.

The path coefficient from “ideal goodwill” to “practical goodwill” was 0.29, making it significant ($p<.01$). However, the path coefficient from “ideal goodwill” to “practical action” was not significant. Therefore, although there is a link between ideal goodwill and practical goodwill towards persons with intellectual disabilities, “ideal goodwill” is not directly linked to “practical action.”

The path coefficient from “practical goodwill” to “practical action” was 0.43, making it relatively large and statistically significant ($p<.01$). Consequently, it can be said that practical goodwill towards persons with intellectual disabilities exerts an influence on practical action.

**Discussion**

Past research on attitudes towards persons with intellectual disabilities was performed through analyses of questionnaire items and exploratory factor analysis. However, the analysis of questionnaires and exploratory factor analysis have limitations in that analysis of causal relationships among variables is impossible. Therefore, in the present study, causal relations among latent variables of attitudes towards and experiences with persons with intellectual disabilities were examined by creating latent variables (constructs) based on the results of exploratory factor analysis and cluster analysis.

According to the results of Narukawa and Maekawa (2004), it was possible to predict that if goodwill towards persons with intellectual disabilities in the conceptual/ideal dimension can be increased through affirmation of their abilities and acceptance of interaction with persons with intellectual disabilities, this will lead to increased goodwill on the concrete/real dimension. In other words, it was possible to consider causal relationships among 4 or 5 latent variables (constructs) regarding attitudes towards persons with intellectual disabilities. However, because Narukawa and Maekawa (2004) reexamined published studies on attitudes, re-analyzed data,
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and constructed models after the data had been collected, the structure of the models was inadequate. Although they were able to make some inferences about causal coefficients among the constructs, they were unable to elucidate what kinds of causes affect constructs such as “integration into the community,” and “affirmation of ability”. Further, they were unable to elucidate precisely factors that may exert influence on “practical goodwill,” other than “ideal goodwill.”

In the present research, hypotheses were constructed based on the results of the analyses of Narukawa and Maekawa (2004). Data were collected, and causal relationships among constructs (latent variables) considered.

A causal model of attitude formation was constructed (Fig. 1), assuming that experiences with integrated education in elementary and middle school, contact experience with children with intellectual disabilities, and talking at home about children with intellectual disabilities, would probably influence the “acceptance of integration in the classroom,” “affirmation of ability,” “ideal goodwill,” and “practical goodwill” latent variables. Results obtained from verifying the model are shown in Fig. 2.

Examining Fig. 2, it became clear that experiences during elementary and middle school years exert an influence on “affirmation of ability,” “acceptance of integration in the classroom,” “ideal goodwill,” “practical goodwill,” and “practical action.”

The path coefficient from “elementary school integration” to “family conversations” was not large, but it was statistically significant. This supports the findings of Uetani (1992) that students at middle schools that conduct exchanges with schools for children with physical disabilities more often discussed persons with disabilities at home, as compared with students whose schools conducted no such exchanges. However, although it was assumed that “elementary school integration” would exert positive influences on “affirmation of ability,” “acceptance of integration in the classroom,” and “ideal goodwill,” etc., the result of the analysis did not consistently support this assumption. In fact, path coefficients from “elementary school integration” to “affirmation of ability” and “ideal goodwill” show small but significant minus values. One possible reason for this is that among the participants who responded who had experienced integrated education were included individuals who were unable to attach a positive significance to this experience. In these cases, integrated education during elementary and middle school years would probably not lead to favorable attitudes.

Aoki (1998) analyzed data from surveys of 300 college students and other adults, in which 207 of the 300 participants had experienced integrated education. Of these, 172 (83%) gave integrated education a positive evaluation, while 35 (17%) gave it a negative evaluation. This indicates that integrated education is not always positively evaluated.

Comparisons have been made using the same scales as the research of Narukawa (1995) with persons who had experienced no interaction with children (persons) with intellectual disabilities during elementary and middle school (group that could not assign significance), persons who did experience interaction and felt the experience to
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have significance (group that discovered significance), and persons who did experience interaction but felt uncertain about the significance of those experiences (group that was uncertain about significance) (Otani, 2002). Statistically significant differences were found for two scales: “acceptance of integration in the community” and “practical goodwill”. Scores from the group that was uncertain about significance were the lowest. This indicates that if uncertainty exists as to the significance of experiences of interacting with children (persons) with intellectual disabilities during elementary and middle school years, it becomes difficult to form favorable attitudes. Thus, in order to utilize integration and interaction experiences in a positive form for attitude formation towards persons with intellectual disabilities, it is probably important that children/students be able to assign a positive significance to these activities.

The research of Yamaguchi (1969) and Voeltz (1980) suggests that integration and interaction are likely to be used positively in attitude formation in cases where the school has paid attention to bringing together children with and without disabilities in a meaningful way. However, it is very possible that merely putting children with disabilities together with children without disabilities will not lead to improved attitudes.

In the free-answer portion of this survey, some students commented on the difficulties of integrated education. “Taking classes together with intellectually disabled children was pretty tough. There was a child with intellectual disabilities in my class in middle school, but it was difficult to concentrate when that child sat next to me, since the child would yell during class, or sometimes get up and run out of the room,” wrote one participant. Integrated education must be implemented in consideration of the type and degree of the child’s disability and prerequisites for taking classes. It is likely that integration in form only will actually have a negative impact (Misawa, 1984).

The path coefficient from “affirmation of ability” to “ideal goodwill” was comparatively large. Consequently, it can be said that if an attitude of affirmation of the abilities of persons with intellectual disabilities is formed, ideal goodwill is increased, and this in turn leads to practical goodwill. The coefficient from “affirmation of ability” to “feelings of resistance” showed a comparatively large, negative value. Therefore, it is conceivable that “affirmation of ability” plays a role in reducing “feelings of resistance” towards persons with intellectual disabilities. Moreover, “affirmation of ability” also exerts some influence on “acceptance of integration in the classroom.”

The path coefficient from “practical goodwill” to “practical action” was comparatively large. Consequently, an attitude that is disposed towards wanting to volunteer on behalf of persons with intellectual disabilities or befriend them, leads to practical actions such as discussing persons with intellectual disabilities and volunteer activities.

Participating in practical actions after graduation from middle school worked positively on affirmation of ability. This is probably because the volunteer work led to reassessment of the abilities of persons with intellectual disabilities.
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Concerning the influence that integrated education exerts on attitude formation, hereafter, it will be necessary to extract variables that can clearly differentiate integration that has a positive effect from that which has a negative effect. Furthermore, it will be necessary to find variables that can clarify contact characteristics and variables that exert an influence on the affirmation of the ability of people with intellectual disabilities.

References


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