Developmental expectations of Dutch, Turkish-Dutch, and Zambian mothers

Willemsen, M.E.; van de Vijver, F.J.R.

Published in:
International Journal of Behavioral Development

Publication date:
1997

INTERNATIONAL JOURNAL OF BEHAVIORAL DEVELOPMENT, 1997, 21 (4), 837–854

Developmental Expectations of Dutch, Turkish-Dutch, and Zambian Mothers: Towards an Explanation of Cross-cultural Differences

Madde E. Willemsen and Fons. J. R. van de Vijver
Tilburg University, The Netherlands

In this study, three models of cross-cultural differences of developmental expectations by parents were examined. The domain dependence model holds that differences vary across psychological domains such as perception and cognition. The cumulative differences model states that cross-cultural differences increase with age. The context variables model holds that cross-cultural differences in developmental expectations are mainly a function of background variables such as differences in parental education. The expectations of mothers in three different cultures were examined. Sixty eight Dutch, 50 Turkish-Dutch (Turkish women living in The Netherlands), and 69 Zambian mothers were asked to indicate the expected age of mastery for each of 77 skills, covering a broad range of behaviours. Zambian mothers expected most skills to develop at a later age than did Dutch and Turkish-Dutch mothers. Partial support was obtained for each model.Tentative evidence was obtained that the domain dependence model could explain most and the cumulative differences model the least cross-cultural differences.

In recent years much attention has been paid to the study of *developmental expectations*. Various closely related terms have been utilised in the literature such as *parental perceptions*, *beliefs* and *attributions*, *social cognitions*, *developmental models*, *implicit developmental theories*, *naive developmental theory*, *developmental timetables* (Goodnow, 1984, 1985), *parental ethnotheories* (Harkness & Super, 1992), and developmental tasks (Havighurst, 1972). The most important topics in these studies are the nature of the expectations, their origins, and their influence on the development of the child (Miller, 1986).

The present study addresses the patterning of cross-cultural variations in age differences at which parents expect their children to have acquired

Requests for reprints should be sent to Fons van de Vijver, Department of Social Sciences, Tilburg University, P.O. Box 90153, 5000 LE Tilburg, Tilburg, The Netherlands; e-mail: fons.vandevijver@kub.nl.

various skills. An overview will be presented of cross-cultural studies of developmental expectations. This will be followed by a discussion of models to explain cross-cultural differences in these expectations.

Cross-cultural research has shown that developmental expectations of parents differ across cultures. For example, Hess, Kishiwagi, Azuma, Price, and Dickson (1980) asked Japanese and American mothers at what age they expect children to develop various skills. The skills were divided into seven categories: school-related skills, verbal assertiveness, compliance, politeness, emotional maturity, instrumental independence, and social skills. Japanese mothers expected earlier mastery of self-control, compliance with adult authority, and social courtesy, whereas the American mothers expected earlier acquisition of skills that display individual action, standing up for one's rights, and other forms of verbal assertiveness.

Goodnow, Cashmore, Cotton, and Knight (1984) studied developmental expectations of Australian-born and Lebanese-born mothers, all living in Australia. The mothers were asked to indicate the expected age of development of 40 skills (32 skills from Hess et al., 1980, and 8 additional skills). The results showed substantial cross-cultural differences. The Lebanese-born mothers expected a significantly later age than the Australian-born mothers on half of the items. Social skills and verbal assertiveness revealed the largest cultural differences, with Lebanese-born mothers expecting a later age than Australian-born mothers. The authors argue that the observed cross-cultural age differences may reflect the value attached to the skills in the two groups.

Pomerleau, Malcuit, and Sabatier (1991) and Sabatier (1994) studied the parental conceptions about early development among mothers in Montreal, Canada, and Rennes, France. In Montreal, 45 Quebecois, 38 Haitian, and 20 Vietnamese mothers (first generation immigrants) were interviewed, in Rennes, 30 French and 30 African and South-East Asian mothers. The mothers indicated the expected ages of developmental milestones and mastery of cognitive and affective abilities. Most differences were found between immigrant mothers and both Quebecois and French mothers. The latter groups expected most skills to develop at an earlier age, especially perceptual and cognitive skills.

Pregnant (primiparous and multiparous) women in Germany and Costa Rica were asked to provide information about their developmental expectations, caregiving and child-rearing activities, and sources of information on child development by Keller, Miranda, and Gauda (1984). Again, there was a significant effect of culture, particularly in the area of cognitive skills. Compared to Costa-Rican mothers, German mothers expected these skills to develop earlier and also reported to engage in caregiving activities in the cognitive area when the child was younger. Costa-Rican mothers indicated a more prolonged bodily dependence

between mother and child (e.g. longer breast feeding). No substantial differences were found between primiparous and multiparous women.

It appears, in sum, that the cross-cultural studies of developmental expectancies yield a fairly clear-cut picture. Differences are often found in the expected age of mastery of skills. Western parents often indicate a lower expected age of mastery than non-Western parents.

Because cross-cultural studies of developmental expectations are still scarce, it is not surprising that the studies reported are more exploratory than explanatory. Yet, it is the task of cross-cultural psychology both to document and explain cross-cultural differences (e.g. Poortinga & Malpass, 1986). As a first attempt to develop a framework for the interpretation of cross-cultural differences, three models are proposed here. The three models proposed do not serve as competing explanations. Rather, they describe first attempts to study various aspects of cross-cultural differences such as their overall patterning, their evolvement, and their antecedents.

The first model, which could be labelled the *domain dependence model*, is geared at the patterning of cross-cultural differences. It starts from a taxonomy of cross-cultural differences developed by Poortinga and Van de Vijver (Poortinga, Kop, & Van de Vijver, 1990; Van de Vijver & Poortinga, 1990). The authors distinguish six behavioural domains, namely, *physical*, *perceptual*, *cognitive*, *intra-individual*, *inter-individual*, and *social*. Going from the first to the last domain, behaviour is increasingly influenced by cultural transmission (as opposed to genetic transmission); as a consequence, cross-cultural differences will increase in this direction. If developmental expectations are functionally related to children's behaviour, the cross-cultural differences in expected age will increase in the aforementioned order; differences will be smallest for the physical and largest for the social domain. Evidence that cross-cultural differences are not invariant across domains was obtained by Sissons Joshi, and MacLean (1997) even though their domains were somewhat different from ours.

The second model, labelled a *cumulative differences model*, is derived from Jensen's (1974, 1977) *cumulative deficit model* and addresses the relationship between the age of mastery of a skill and the cross-cultural differences in mastery of the skill. Jensen's model predicts that performance differences on cognitive test scores will increase with age. Analogously, the *cumulative differences model* states that cross-cultural differences in developmental expectations will increase with age. Age is not a real explanation but merely a proxy. There may be various mechanisms underlying the model. For example, when children grow older, they may become more educated or more knowledgeable about the cultural norms of their environment. This kind of explanation is further explored in the last model.

This model, labelled the *context variables model*, addresses antecedents of cross-cultural differences in parental expectations. Poortinga and Van de Vijver (1987; Van de Vijver & Leung, 1997) have proposed context variables as a generic term for antecedents of cross-cultural differences. The context variables model is a general approach to cross-cultural differences in which external variables (the context variables) are used to explain statistically cross-cultural differences. The model does not yet specify the nature of these variables but merely provides a statistical-methodological framework in which the role of these variables in the validation of cross-cultural differences is emphasised. Cross-cultural differences in developmental expectations are taken in this model to be engendered by differences in background variables across cultural groups such as education, income, or number of children. In this model, no cross-cultural differences in developmental expectations should remain after all relevant background variables are (usually statistically) accounted for. In this model, culture is a coreless concept, methodologically defined as a set of often loosely interrelated independent variables (cf. Lonner & Adamopoulos, 1997; Poortinga, Van de Vijver, Joe, & Van de Koppel, 1987). This concept of culture is used here throughout. Cashmore and Goodnow (1987) showed that after educational background was taken into account, cross-cultural differences between Anglo-Australian and Italian-Australian parents in the perceived value of children's conformity virtually disappeared. In the study carried out by Hess et al. (1980), SES was modestly correlated with the mothers' overall developmental expectations; mothers from higher socioeconomic backgrounds tended to indicate a slightly earlier age of mastery. Furthermore, SES correlated significantly with the expectations of Japanese mothers regarding social skills and with the expectations of American mothers regarding verbal assertiveness. In both countries mothers of high SES expected an earlier mastery of school-related skills.

Intra-cultural research with Western subjects has shown that background variables such as parental education, occupation, income, age, and gender have a bearing on developmental expectations (McGillicudy-DeLisi, 1980, 1982; Palacios, 1990; Stevens, 1988). Mothers of high SES expected earlier mastery of cognitive skills than mothers of low SES (Ninio, 1979). Reis (1989) compared three different age groups of mothers on appropriateness of developmental expectations. The results showed that teenage mothers are less knowledgeable about child development than mature mothers. Also, compared to mothers, fathers expected that skills develop at a later age and showed more variation in their expectations (Ninio, 1988). Vukelich and Kliman (1995) found that a mother's occupation, age, and educational level affect her expectations. Solís-Cámara and Fox (1995) did not find differences in developmental expectations of Mexican and US mothers who were matched on maternal education, marital status, and SES. In sum, the

admittedly limited evidence available suggests that the cross-cultural differences in developmental expectations reported may be due, at least partially, to differences in background variables such as SES, educational background, or age.

The present study examines the feasibility of the previous models to explain cross-cultural differences in developmental expectations of Dutch, Turkish-Dutch (i.e. Turkish mothers living in The Netherlands), and Zambian mothers. As indicated earlier, developmental expectations vary with modernisation (Segall, Dasen, Berry, & Poortinga, 1990, pp. 302–303) of the cultural groups; hence, the three cultures of the current study were chosen in such a way that they differed in modernisation. The Dutch and Zambian groups can be taken to represent higher and lower levels of modernity, respectively. The Turkish-Dutch group can be seen to have an intermediate position.

METHOD

Sample

The sample consisted of 68 Dutch, 50 Turkish-Dutch, and 69 Zambian mothers. Most of them were approached via the primary school of their children and a small part was recruited via snowball sampling. Ten percent of the Turkish sample consisted of mothers involved in OPSTAP, the Dutch version of the HIPPY programme (a cognitive intervention programme; Eldering & Vedder, 1992). The Dutch subjects were living in four different villages: Horst (n = 16), Hilvarenbeek (n = 15), Kerkrade, and Landgraaf (n = 37). The Turkish-Dutch subjects were living in two different towns: Tilburg (n = 5) and Deventer (n = 45). Eighteen percent of the Turkish-Dutch mothers had been living in The Netherlands for less than 5 years, 25% between 5 and 10 years, and 57% at least 11 years. At the time of the interview the Zambian subjects were all living in Lusaka, the capital city of Zambia, but originally they came from various provinces: Western (n = 9), Eastern (n = 22), Southern (n = 9), Northern (n = 9), Lusaka (n = 4), Central (n = 7), Luapula (n = 4), and other provinces (n = 5).

The average age in the Dutch sample was 35.5 years (SD = 4.78). In the Turkish-Dutch sample the average age was 28.7 years (SD = 5.06), and in the Zambian group 35.1 years (SD = 5.06).

Almost all mothers (93%) in the three samples were married. The average number of children of the Dutch mothers was 2.34 (range: 1–4); for the Turkish-Dutch mothers the average was 2.20 (range: 1–5), and for the Zambian mothers 4.54 (range: 1–10).

All Dutch mothers completed primary, 92% secondary, and 60% tertiary education. The figures for the Turkish-Dutch mothers were 92%, 44%, and 16%, respectively. Seventy-four percent of the Turkish-Dutch mothers

received their education in Turkey and 22% in The Netherlands (4% did not receive any education). Seventy-seven percent of the Zambian mothers finished primary, 24% secondary, and 21% tertiary education. In particular, the latter figures point to a bias towards the better educated upper class in our sample; the national enrolment rate in tertiary education in 1995 in Zambia was 2.1% (United Nations, 1996).

Of the Dutch sample, 56% were housewives, 11% teachers, and 33% had other professions (e.g. cashier, librarian, midwife, and tailor). For the Turkish-Dutch sample the corresponding percentages were 70%, 2%, and 28% (e.g. dressmaker and cleaning lady) and for the Zambian sample 63%, 10%, and 27% (e.g. cashier, cleaner, nurse, market vendor, typist, and traditional healer).

Instruments

The instrument consisted of 87 items (see Table 2). The items were adapted from a list of 153 developmental skills compiled from Gesell and Ilg (1946). About half of the items could not be used because of their Western bias and inappropriateness in other cultures. In addition, some skills were rephrased (simplified) and some new skills were added to ensure a good representation of skills across ages and domains.

The skills were split up according to six domains. Physical skills refer to activities which primarily involve gross motor activities such as *walking without help* and *swimming*. Perceptual skills involve activities combining perception and fine motor activities such as *hammering* and *turning pages of a book*. Cognitive skills refer to all kinds of mental activities such as *reading*, *writing*, and *naming the days of the week*. Intra-individual skills refer to personality traits that do not or marginally involve others such as *being afraid of storm* and *criticising oneself*. Inter-individual skills are traits involving other people such as *being jealous of toys of others* and *criticising others*. Social skills refer to behaviours involving other people such as *playing with siblings* and attitudes with strong relational aspects such as *having a strong feeling for the family*. Compared to inter-individual skills, social skills presuppose a stronger implicit or frequently explicit involvement of others. Even though we will refer to the item content as skills, several items describe behaviours rather than skills (e.g. *afraid when mother leaves* and *jealous of toys of others*). The order of the items was randomised across the domains. The inter-rater agreement in the assignment of skills to the six domains was assessed by two independent raters (the authors). Their agreement was 94%.

In a pilot study in Zambia the suitability of the list was studied. The list of 87 skills was discussed with female teachers with the aim of judging the suitability of the list for Zambia. This led to the elimination of 10 items.

Examples of eliminated items were "wants to help teachers" and "look at pictures". The teachers were also asked to judge the completeness of the list. Because all new skills generated were culture-specific such as iron-wire modelling and making ornaments with seeds and leaves, no items were added.

The skill was printed at the top of the page. The question *At what age do you expect a child to be able to do this for the first time?* was printed below. The response alternatives were *0 or 1 year old*, *2 or 3 years old*, *4 or 5 years old*, *6 or 7 years old*, *8 or 9 years old*, and *older than 9 years*. The skills were formulated in line with the recommendations of Holden and Edwards (1989); an effort was made to avoid ambiguous wordings and the inclusion of two or more skills in a single item.

The instrument was administered in a structured interview. For the Zambian subjects the questions were translated in English, the official language in Zambia, and for the Turkish sample in Turkish. In order to check the accuracy of the translation both the English and the Turkish version were backtranslated into Dutch. In The Netherlands the interviews were held by the first author and a Dutch student. The Turkish-Dutch mothers were interviewed by the Dutch student and an interpreter, the Zambian mothers by the first author and a local assistant. The Zambian interviews were held in English; most mothers had a good mastery of English. In addition, parts of some interviews were held in Nyanja and Tonga, two local languages which were spoken by the local assistant.

The internal consistencies (Cronbach's alpha) for the whole instrument (77 items) were .90 in each cultural group. The values of the separate domains, which have been presented in Table 1, were appropriate although the values of the physical and perceptual domains were somewhat lower even if the smaller number of items of these scales is taken into account. Furthermore, a test of the equality of the internal consistency coefficients across the three cultural groups (as described by Hakstian & Whalen, 1976) did not show any significant results.

TABLE 1
Reliability Coefficients of the Domains per Cultural Group

	Cultural Group			*Test of Equality*
	Dutch	*Turkish-Dutch*	*Zambian*	(*P*)
Physical (11 items)	.56	.52	.60	.53 (.81)
Perceptual (9 items)	.52	.50	.49	.06 (.97)
Cognitive (19 items)	.83	.77	.82	1.26 (.53)
Intra-individual (14 items)	.70	.77	.70	1.22 (.55)
Inter-individual (11 items)	.69	.61	.72	1.39 (.50)
Social (13 items)	.70	.74	.78	1.49 (.47)

In preliminary analyses place of birth and current place of residence were found to be unrelated to the domain scores for expected age of mastery in each cultural group. Finally, in the Turkish-Dutch group the place of birth (urban: $n = 31$; rural: $n = 19$) and length of stay in The Netherlands were unrelated to the domain scores. Therefore, these variables were not considered in the remainder of the analyses.

RESULTS

Prior to a study of the feasibility of the models of cross-cultural differences, a description of cross-cultural differences per skill and domain is given.

Cross-cultural Differences per Skill and Domain

The average expected ages per item for each cultural group are given in Table 2 and the means per domain in Fig. 1. A MANOVA was carried out, with culture as the independent variable and domain scores (i.e. average scores on the items of a domain) as dependent variables. The analysis showed that the effect of culture was significant ($P < .01$; see Table 3). It was found in the univariate analyses that the differences between the averages of

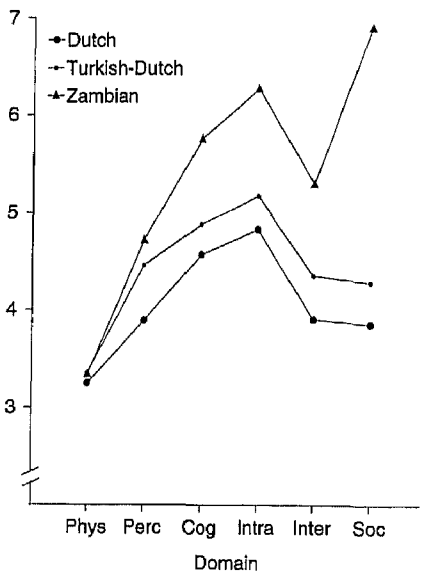

FIG. 1 Average expected age score per psychological domain for each culture.

TABLE 2
Mean Age per Item for the Dutch (D), Turkish-Dutch (TD), and Zambian (Z) Mothers

	Mean Age			
Domain Skill	*D*	*TD*	*Z*	*F*[a]
Physical				
Toilet-trained	2.43	2.38	1.92	7.63***
Colour within lines	4.47	4.70	3.78	9.82***
Bath without help	6.41	7.70	5.51	17.88***
Walk without help	1.06	1.17	1.72	11.79***
Carry water	3.62	3.78	4.42	4.33**
Thumb-sucking	0.77	0.82	0.91	1.47
Swimming	5.67	5.19	7.37	23.77***
Eat without help	2.64	3.16	1.90	21.10***
Run up and down stairs	3.33	2.80	3.24	2.72
Throw and catch balls	4.53	4.27	4.76	0.99
Stand without help	0.83	0.99	1.08	3.47*
Perceptual				
Knitting	7.92	8.42	6.79	14.98***
Turn pages of a book	1.81	2.81	3.36	28.38***
Dance to music	2.01	1.63	2.82	12.14***
Recognise letters	4.68	5.06	5.37	4.19*
Dress without help	4.50	5.10	4.73	3.08*
Cry because of hunger	0.88	1.10	1.25	2.80
Draw figures correctly	5.82	5.86	6.67	6.15**
Hammering	3.39	5.31	5.72	22.18***
Use scissors to cut	4.18	4.86	5.78	12.57***
Cognitive				
Say "mamma"	0.78	0.96	1.21	10.03***
Decide/make choices	2.79	4.07	4.70	21.41***
Division/multiplication	7.79	7.86	7.51	1.02
Tell what time it is	7.03	7.14	7.92	6.54**
Write own name	4.53	5.18	5.98	23.86***
Call self by name	2.28	2.50	3.26	21.18***
Tell what season it is	6.18	6.58	8.21	22.16***
Distinguish men/women	2.90	3.41	3.98	8.67***
Addition/subtraction	6.09	6.78	7.22	13.71***
Use baby-talk	1.68	1.95	1.87	1.32
Write first words	5.58	5.22	6.36	9.92***
Reading	6.29	6.42	6.88	4.79**
Does not use baby-talk	4.23	4.78	5.02	3.63*
Count to 10	4.09	3.86	4.64	6.55**
Verbalise ideas/problems	4.79	5.02	8.18	67.43***
Write first sentences	6.55	6.38	8.21	47.51***
Draw and write letters	4.29	4.98	6.88	56.89***
Ask many questions	3.04	3.58	4.33	14.86***
Name days of the week	5.85	6.10	6.96	9.48***

Table 2—cont.

Domain Skill	Mean Age D	TD	Z	F[a]
Intra-individual				
Afraid when mother departs	1.43	2.90	3.52	25.14***
Say "I want"	2.38	2.77	3.26	10.12***
Want responsibility	4.71	5.26	6.77	13.21***
Be treated as an adult	7.85	7.50	8.88	5.81**
Worry being late for school	6.28	6.54	7.34	6.17**
Cry a lot	0.96	1.17	1.17	1.11
Afraid of rain, storm, and darkness	3.27	3.36	3.42	0.15
Criticise self	6.14	5.90	6.88	3.33*
Get over crying by itself	4.91	2.82	4.12	14.91***
Want to be independent	4.08	6.46	8.36	56.91***
Afraid mother may die	6.68	6.54	8.81	24.64***
Afraid of witches, ghosts, etc.	3.96	4.26	7.92	89.49***
Afraid to fail at school	6.47	7.90	8.36	20.46***
No longer afraid of rain storm, and darkness	8.80	8.94	8.88	0.07
Inter-individual				
Be a good loser in a game	7.47	7.62	7.94	0.75
Jealous of toys of others	3.70	3.34	3.46	0.75
Demand things from parents	5.98	5.41	4.82	4.41*
Criticise others	5.82	6.22	7.14	6.96**
Good manners towards adults	4.86	7.03	7.74	34.31***
Afraid of strangers	1.75	2.55	4.12	28.71***
Like to obey	4.16	5.30	6.47	20.09***
Smile at the sight of a face	0.90	1.17	1.94	9.77***
Not obeying orders	2.82	3.49	6.80	54.57***
Cannot share or wait for a turn	2.86	2.85	4.42	16.68***
Call names	2.58	2.74	3.30	6.63***
Social				
Helpful within family	5.03	5.58	7.66	30.93***
Co-operative in game	4.06	3.76	8.12	149.06***
Say "hello"/"goodbye"	2.25	2.94	4.33	27.67***
Strong feeling for family	3.97	4.72	7.73	45.99***
Remember the names of uncles and aunts	3.29	3.94	6.04	46.00***
Not co-operative in game	2.15	1.64	5.46	89.79***
Have one special friend	5.06	5.22	8.36	42.17***
Like to visit family	3.15	3.99	8.41	151.81***
Teach younger siblings	3.11	3.46	5.98	48.56***
Play with siblings	4.26	5.10	7.71	62.61***
Say "please"/"thank you"	3.68	4.38	5.52	19.10***
Use word "friend"	4.53	4.34	6.24	20.39***
Enjoy competition	5.41	6.54	8.01	30.19***

[a] F ratio of one-way analysis of variance.
* $P < .05$; ** $P < .01$; *** $P < .001$.

the three cultures were significant for all but the physical domain. *Post-hoc* comparisons (Student Newman–Keuls) for each domain revealed that all groups differed significantly ($P < .01$) from each other on these five domains. The Zambian subjects invariably expected the highest ages of mastery and the Dutch subjects the lowest.

A closer inspection of Table 2 shows that at item level this pattern is fairly well reproduced, with the exception of some items from the physical domain. However, it is interesting to observe that the expected ages were lowest in the Zambian group for various self-care activities such as "toilet-trained", "bath without help", and "eat without help".

Explanatory Models

According to the *domain dependence model*, cross-cultural differences should increase with the cultural entrenchment of the domain. The proportion of variance in the expected age of mastery accounted for by culture was used as a measure of the size of cross-cultural differences. In order to test the model, the proportions were computed for the MANOVA on age reported in Table 3. The proportions are presented in Fig. 2. The model predicts a perfect rank order between the position on the horizontal axis of Fig. 2 and the proportion of variance accounted for. The cross-cultural differences tend to increase in the expected order but the rank order was not perfect; Spearman's ρ was .77 ($P = .07$). The cognitive, intra-individual, and inter-individual domains did not show the hypothesized order.

The *cumulative differences model* postulates a positive relationship between age and the size of cross-cultural differences. In Fig. 3, the means of

TABLE 3
Multivariate Analysis of Variance for Age Before and After Correction for the Background Variables

		Domain (F)					
Source	*df*	*Phys.*	*Perc.*	*Cog.*	*Intra.*	*Inter.*	*Soc.*
Before (Multivariate, $F(12,358) = 26.64$*)							
Culture	2	0.57	25.29*	55.55*	47.56*	37.65*	196.59*
S within-group error	184	(0.34)	(0.48)	(0.46)	(0.80)	(0.90)	(0.92)
After (Multivariate, $F(12,350) = 16.90$*)							
Culture	2	0.12	10.62*	26.85*	23.00*	17.66*	110.13*
S within-group error	180	(0.33)	(0.48)	(0.46)	(0.79)	(0.88)	(0.82)

Note: Values enclosed in parentheses represent mean square errors. Phys., physical; Perc., perceptual; Cog., cognitive; Intra., intra-individual; Inter., inter-individual; Soc., Social; *S*, subjects.

*$P < .01$.

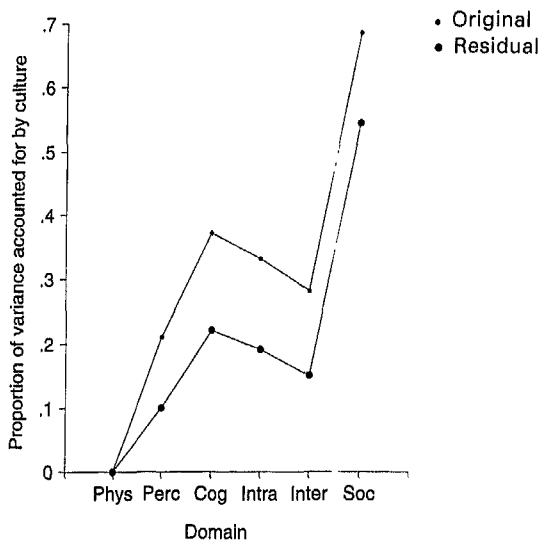

FIG. 2 Proportion of variance of the original and the residual scores explained by culture for expected age of mastery. *Note*: Original: proportion of variance accounted for by culture in the observed scores; Residual: proportion of variance accounted for by culture after statistical correction for the background variables (see Table 3).

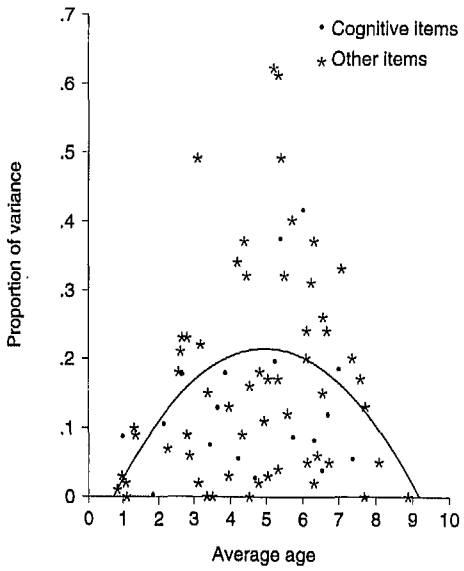

FIG. 3 Relationship between overall mean age scores and proportion of variance accounted for by cultural differences.

the three cultures are plotted against the proportion of variance explained by culture in an ANOVA with culture as independent variable and the item's score as dependent variable. As can be seen in Fig. 3, there is a curvilinear relationship between the variables. A quadratic regression equation was fitted, with average age as independent variable and proportion of variance accounted for as dependent variable. The equation explained 14% of the variance [$F(2, 74) = 6.13$, $P < .01$]. The linear and quadratic regression coefficients were both significant (linear coefficient = .119, $t = 3.46$, $P < .01$; quadratic coefficient = $-.012$, $t = 3.24$, $P < .01$). The curve is drawn in Fig. 3. It is remarkable that the unsystematic error is not homoscedastic. The error is largest between 3 and 7 years of age. At all ages, there are skills that show hardly any cross-cultural differences; however, particularly between, say, 3 and 7 years there are also skills that show large cross-cultural differences. There are 14 items with an F-value above 40 ($\omega^2 > .30$), namely the cognitive skills: *verbalise ideas and problems*, *write sentences*, and *draw and write first letters*, the intra-individual skills *wants to be independent* and *afraid of witches and ghosts*, the inter-individual skill *does not obey orders* and the social skills *is co-operative in a game*, *has a strong feeling for the family*, *remember names of aunts and uncles*, *is not co-operative in a game*, *has one special friend*, *likes to visit family*, *teach young siblings*, and *play with young siblings*. Thus, large differences are mainly found in the social domain.

According to the third model, the *context variables model*, there should be no remaining cross-cultural differences after statistical correction for background variables. The statistical analysis consisted of two steps. In the first step the context variables are used as predictors of the expected ages in the combined sample; residual scores (i.e. scores on expected ages not accounted for by the background variables) are computed. The presence of cross-cultural differences in the residual scores are tested in the second step. If no significant differences remain, then the cross-cultural differences in expected ages are accounted for by the background variables. Multiple regression analyses were carried out for the three samples per domain, with the mother's employment status (dichotomously scored as either or not employed), educational level, number of children and age as independent variables and the expected age as dependent variable. All domains except for physical abilities revealed significant multiple correlations, ranging from .15 to .38 ($P < .01$; see Table 4). Education and number of children were the most effective predictors. Higher educated mothers reported lower ages. Mothers with more children reported later ages.

Subsequently, a MANOVA was carried out for each of the residual domain scores (Table 3). In all domains the variance of the residual scores was much smaller than the variance of the original scores (Fig. 2). The background variables reduced the proportion of explained variance by on

average 67%. Yet, correction for the background variables did not eliminate the intergroup differences; the MANOVAs for the original and residual scores were significant for the same five of the six domains ($P < .01$).

Finally, the relative predictive power of the three models to explain cross-cultural differences was compared. Unfortunately, a direct comparison of the three models is impossible because the *domain dependence* and *cumulative differences model* refer to stimulus characteristics whereas the *context variables* utilises subject characteristics. The predictive power of the *domain dependence model* was examined by correlating the estimated proportion of variance with the rank order of the domain. The estimated proportion of variance was obtained in an analysis of variance with skill as the dependent variable and cultural group as independent variable. The rank order was formed by assigning the number one to all physical skills, two to perceptual skills, and so on. The correlation was .47 ($P < .01$). The predictive power of the *cumulative differences* was examined by correlating the (same) proportions of variance to the overall mean age of the skill. The correlation was .14 (ns). The *context variables model* was tested in a regression model. The same predictors were used as in the test of the *context variables model*: the mother's employment status (dichotomously scored as either employed or not employed), educational level, and the number of children. The dependent variable was the mean age across the three cultural groups; for each of the 77 skills a separate regression analysis was carried out. The average multiple correlation of the 77 analyses was .30. It can be concluded that in the present data set the *domain dependence model* was a more powerful predictor of cross-cultural differences than the *cumulative differences model*. It is tempting to conclude that the *context variables model* occupied an intermediate position. Yet, some caution is required in comparing the predictive power of the models because the *context variables model* is based on individual-level data whereas the test of the other models was based on aggregated data.

TABLE 4
Multiple Regression Analyses for Background Variables Predicting Age

	Domain					
Variable	*Phys.*	*Perc.*	*Cog.*	*Intra.*	*Inter.*	*Soc.*
Employed	0.16	0.13	0.12	0.15*	0.19*	0.20*
Education	−0.15	−0.30*	−0.34*	−0.34*	−0.36*	−0.43*
No. of children	0.06	0.20*	0.29*	0.23*	0.18*	0.35*
Age	−0.12	−0.20*	−0.12	−0.01	0.01	0.01
R^2	0.04	0.15*	0.22*	0.20*	0.19*	0.38*

Note: Figures are standardised regression coefficients. Phys., physical; Perc., perceptual; Cog., cognitive; Intra., intra-individual; Inter., inter-individual; Soc., social.
*$P < .05$.

DISCUSSION

The study examined cross-cultural differences in developmental expectations among Dutch, Turkish-Dutch, and Zambian mothers. The Zambian subjects expected the highest ages of mastery and the Dutch subjects the lowest. These results confirm earlier findings that non-Western mothers expect later ages than Western mothers.

Three models of cross-cultural differences were tested. Cross-cultural differences tended to increase in the order as postulated by the *domain dependence model* (i.e. physical, perceptual, cognitive, intra-individual, inter-individual, and social), but salient deviations were found. Two interpretations of the deviations may be envisaged. Looking at Fig. 2, it could be argued that the value of cognitive skills is too high *vis-à-vis* the values of the intra-individual and inter-individual domains. It was examined as to whether the deviance may be due to differences in schooling. Cognitive items may represent skills learned in preschool and primary school; Zambian children often do not go to a preschool and primary school starts at seven years, whereas in The Netherlands most children start preschool at the age of four and primary school at six years. We tested cross-cultural differences in school and nonschool skills. An ANOVA showed that there were no significant differences. Another explanation for the relatively large cross-cultural differences in cognitive skills could be found in differences in the value parents associate with developmental skills. Various authors seem to work from the assumption that skills which are valued more, are expected at an earlier age (e.g. Hess et al., 1980). In this study, although not presented here, we asked the mothers to indicate for each skill how desirable it is that a child develops this skill. Results showed that Dutch mothers, who expected the earliest development of cognitive skill, also indicated the lowest desirability. Along similar lines, Goodnow et al. (1984, p. 203) argued that, "it is tempting to conclude that the age of expectations reflects the degree of value placed on a particular skill by a particular culture. . . . Any simple equivalence of early expectations with high value, however, is likely to be misleading".

Another interpretation of the deviance of the expected rank order of Fig. 2 might be that the values of the intra-individual and inter-individual skills are too low. We do not favour this interpretation because it is less parsimonious than the aforementioned interpretation (as it involves two domains) and a theoretical rationale of why these domains would deviate from the expected pattern is difficult to give.

The increase of cross-cultural differences as postulated by the *cumulative differences model* was found for ages up to five years. Across the whole range considered, a curvilinear relationship was observed (see Fig. 3); there were more cross-cultural differences for skills which develop between 3 and 7

years of age, especially in the social domain. It could be argued, in line with Jensen's original hypothesis, that the relationship holds only for the cognitive domain. This was examined by restricting the analyses to the cognitive domain (see Fig. 3). The relationship between age and cross-cultural differences was not significant ($r = .09$, ns).

The current study presents evidence that background variables can account for a substantial amount of cross-cultural differences, as postulated by the *context variables model*. Background variables had a significant effect on expected ages, although they could not account for all cross-cultural differences. The choice of context variables in the present study was inevitably restricted. Many other variables could be taken into account, like social pressure mentioned by Goodnow et al. (1984). Mothers' reports may differ from their experiences and may reflect the normative development as perceived by them. Sources of information about child development, in particular developmental milestones such as walking and talking, may well be reflected in the opinions expressed by the mothers (Kliman & Vukelich, 1985; Vukelich & Kliman, 1985). The source of information that parents use in order to "learn" about the development of their children, differs across cultures. This aspect was not addressed explicitly in this study, but during the interviews we got the impression that books, magazines, medical experts, and pregnancy and child-care organisations are important sources for Dutch mothers, though the role of grandparents and friends must not be overlooked. Books, magazines, and institutions are available for Turkish-Dutch mothers as well (although probably not in the same amount in Turkish), but because we did not ask each mother specifically about this, we do not know if they actually utilise these sources. With regard to sources of information about theories of child development in Zambia we were told that there are books (e.g. *The first baby. A guide for new mothers* by M. Shilalukey-Ngoma, 1991) and women's magazines about child rearing available, but they are expensive and are mainly read by upper class parents. Furthermore, there are small institutions in most areas of Lusaka where mothers seek advice from nurses. The most important source is the grandparents, who will tell the (becoming) mother how to handle her first-born baby.

The present study examined the development of children as perceived by their mothers in a self-report mode. We do not know or imply that parental expectations and perceptions reflect differences in actual behaviour. Observational studies of behaviour could well reveal other cross-cultural differences and similarities. Furthermore, it is not unlikely that mothers in different cultures apply differential norms in their definition of mastery. For example, does *being helpful in the kitchen* mean that a child brings his/her own plate to the kitchen or that he/she does the dishes? It might be useful for future studies to first let the mothers define mastery of the skills or provide a detailed description of what is meant with mastery. Furthermore, the

present study was an attempt to move beyond the stage of mere documentation of cross-cultural differences to a test of specific models of such differences. Our knowledge of cross-cultural differences of developmental expectations would be deepened by future studies in which other and more refined models of such differences are tested.

Manuscript received November 1995
Revised manuscript received June 1997

REFERENCES

Cashmore, J.A., & Goodnow, J.J. (1987). Influences on Australian parents' values. Ethnicity versus socioeconomic status. *Journal of Cross-Cultural Psychology, 7*, 441–454.

Eldering, L., & Vedder, P. (1992). *OPSTAP. Een opstap naar schoolsuccess?* Amsterdam: Swets & Zeitlinger.

Gesell, A., & Ilg, F.L. (1946). *The child from five to ten.* New York: Harper & Brothers.

Goodnow, J.J. (1984). Parents' ideas about parenting and development: A review of issues and recent work. In M.E. Lamb, A.L. Brown, & B. Rogoff (Eds.), *Advances in developmental psychology* (Vol. 3, pp. 193–242). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Goodnow, J.J. (1985). Change and variation in ideas about childhood and parenting. In I.E. Sigel (Ed.), *Parental belief systems. The psychological consequences for children* (pp. 235–270). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Goodnow, J.J., Cashmore, J., Cotton, S., & Knight, R. (1984). Mothers' developmental timetables in two cultural groups. *International Journal of Psychology, 19*, 193–205.

Hakstian, A.R., & Whalen, T.E. (1976). A k-sample significance test for independent alpha coefficients. *Psychometrika, 41*, 219–231.

Harkness, S., & Super, C. (1992). Parental ethnotheories in action. In I.E. Sigel, A.V. McGillicuddy-DeLisi, & J.J. Goodnow (Eds.), *Parental belief systems: The psychological consequences for children* (2nd edn., pp. 373–392). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Havighurst, R.J. (1972). *Developmental tasks and education* (3rd edn.). New York: McKay.

Hess, R.D., Kashiwagi, K., Azuma, HJ., Price, G.G., & Dickson, W.P. (1980). Maternal expectations for mastery of developmental tasks in Japan and the United States. *International Journal of Psychology, 15*, 259–271.

Holden, G.W., & Edwards, L.A. (1989). Parental attitudes toward child rearing: Instruments, issues and implications. *Psychological Bulletin, 106*, 29–58.

Jensen, A.R. (1974). Cumulative deficit: A testable hypothesis? *Developmental Psychology, 10*, 996–1019.

Jensen, A.R. (1977). Cumulative deficit in IQ of blacks in the rural south. *Developmental Psychology, 13*, 184–191.

Keller, H., Miranda, D., & Gauda, G. (1984). The naive theory of the infant and some maternal attitudes. *Journal of Cross-Cultural Psychology, 15*, 165–179.

Kliman, D.S., & Vukelich, C. (1985). Mothers and fathers: Expectations for infants. *Family Relations, 34*, 305–313.

Lonner, W.J., & Adamopoulos, J. (1997). Culture as antecedent to behavior. In J.W. Berry, Y.H. Poortinga, & J. Pandey (Eds.), *Handbook of cross-cultural psychology* (2nd edn.), (Vol. 1, pp. 43–83). Chicago IL: Allyn & Bacon.

McGillicuddy-DeLisi, A.V. (1980). The role of parental beliefs in the family as a system of mutual influences. *Family Relations, 29*, 317–323.

McGillicuddy-DeLisi, A.V. (1982). The relationship between parents' beliefs about development and family constellation, socioeconomic status and parents' teaching strategies. In L.M. Laosa & I.E. Sigel (Eds.), *Families as learning environments for children* (pp. 261–299). New York: Plenum.

Miller, S.A. (1986). Parent's beliefs about their children's cognitive abilities. *Developmental Psychology, 22*, 276–284.

Ninio, A. (1979). The naive theory of the infant and other maternal attitudes in two subgroups in Israel. *Child Development, 50*, 976–980.

Ninio, A. (1988) The effects of cultural background, sex and parenthood on beliefs about the timetable of cognitive development in infancy. *Merrill-Palmer Quarterly, 34*, 368–388.

Palacios, J. (1990). Parents' ideas about the development and education of their children. Answers to some questions. *International Journal of Behavioral Development, 13*, 137–155.

Pomerleau, A., Malcuit, G., & Sabatier, C. (1991). Child-rearing practices and parental beliefs in three cultural groups of Montréal: Québécois, Vietnamese, Haitian. In M.H. Bornstein (Ed.), *Cultural approach to parenting* (pp. 45–68). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Poortinga, Y.H., Kop, P.F.M., & Van de Vijver, F.J.R. (1990). Differences between psychological domains in the range of cross-cultural variation. In P.J.D. Drenth, J.A. Sergeant, & R.J. Takens (Eds.), *European perspectives in psychology* (Vol. 3, pp. 355–376). New York: Wiley.

Poortinga, Y.H., & Malpass, R.S. (1986). Making inferences from cross-cultural data. In W.J. Lonner & J.W. Berry (Eds.), *Field methods in cross-cultural research* (pp. 17–46). Beverly Hills, CA: Sage.

Poortinga, Y.H., & Van de Vijver, F.J.R. (1987). Explaining cross-cultural differences: Bias analysis and beyond. *Journal of Cross-Cultural Psychology, 18*, 258–282.

Poortinga, Y.H., Van de Vijver, F.J.R., Joe, R.C., & Van de Koppel, J.M.H. (1987). Peeling the onion called culture: A synopsis. In C. Kagitcibasi (Ed.), *Growth and progress in cross-cultural psychology* (pp. 22–34). Lisse, The Netherlands: Swets & Zeitlinger.

Reis, J. (1989). A comparison of young teenage, older teenage and adult mothers on determinants of parenting. *Journal of Psychology, 123*, 141–151.

Sabatier, C. (1994). Parental conceptions of early development stimulation. In A. Vyt, H. Bloch, & M.H. Bornstein (Eds.), *Francophone perspectives on early mental development* (pp. 299–314). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Segall, M.H., Dasen, P.R., Berry, J.W., & Poortinga, Y.H. (1990). *Human behavior in global perspective.* New York: Pergamon.

Shilalukey-Ngoma, M. (1991). *The first baby. A guide for new mothers.* Lusaka: ZPC Publications.

Sissons Joshi, M., & MacLean, M. (1997). Maternal expectations of child development in India, Japan, and England. *Journal of Cross-Cultural Psychology, 28*, 219–234.

Solís-Cámara, P., & Fox, R.A. (1995). Parenting among mothers with young children in Mexico and the United States. *Journal of Social Psychology, 135*, 591–599.

Stevens, J.H. (1988). Shared knowledge about infants among fathers and mothers. *Journal of Genetic Psychology, 149*, 515–525.

United Nations. (1996). *United Nations yearbook 1995.* New York: Author.

Van de Vijver, F.J.R., & Leung, K. (1997). Methods and data analysis of comparative research. In J.W. Berry, Y.H. Portinga, & J. Pandey (Eds.), *Handbook of cross-cultural psychology* (2nd edn.) (Vol. 1, pp. 257–300). Chicago, IL: Allyn & Bacon.

Van de Vijver, F.J.R., & Poortinga, Y.H. (1990). A taxonomy of cultural differences, In F.J.R. Van de Vijver & G.J.M. Hutschemaekers (Eds.), *The investigation of culture. Towards a cultural psychology* (pp. 91–114). Tilburg, The Netherlands: Tilburg University Press.

Vukelich, C., & Kliman, D.S. (1985). Mature and teenage mothers' infant growth expectations and use of child development information sources. *Family Relations, 34*, 189–196.