



The mediated learning experience (MLE) in a three generational perspective

Esther B. Isman* and David Tzuriel

School of Education, Bar-Ilan University, Ramat Gan, Israel

Previous research has shown that *mediated learning experience (MLE)* strategies are important for the development of cognitive skills. Theoretically, grandparents have a significant role in the intergenerational transmission of MLE strategies. The purpose of this study is to investigate the resemblances and unique characteristics of mothers' and grandmothers' MLE strategies. A sample of 52 Israeli families composed of mother–child and maternal grandmother–child dyads were videotaped at home in two conditions: free play and structured (the same child was observed in each dyad). The interactions were analysed using the *observation of mediated interaction (OMI)*. Higher levels of MLE strategies were found during free play than in the structured condition. Positive correlations between grandmothers' and mothers' MLE strategies were found under both conditions. However, grandmothers provided a higher level of MLE strategies for *intentionality and reciprocity, meaning, and transcendence*, but less mediation of *regulation of behaviour* than mothers. It is concluded that these differences may be the result of either differences in the perceived roles of mothers and grandmothers, or differences in the levels of experience of mothers and grandmothers.

Many researchers have found that specific activities of parents relate to their children's cognitive development, both concurrently and predictively, and that both the child and the parent influence the child's mental development (Berk & Spuhl, 1995; Bornstein, 1985, 1989a, 1989b; Bornstein, Azuma, Tamis-LeMonda, & Ogino, 1990; Klein, 1988, 1996; Tzuriel, 1996, 1999; Wachs, 1992). One approach that may be taken to the development of cognitive skills is the *mediated learning experience (MLE)* approach (Feuerstein, Feuerstein, Falik, & Rand, 2002; Feuerstein, Klein, & Tannenbaum, 1991; Feuerstein, Rand, Hoffman, & Miller, 1980; Feuerstein, Rand, & Rynders, 1988). The MLE is defined as 'an interactional process, in which parents, substitute adults, or peers, interpose themselves between a set of stimuli and the learner, and modify the stimuli for the developing child' (Tzuriel, 2001). One of the major questions is how and to what extent the MLE processes are transmitted from one generation to another, or in other words, how mediation strategies are transmitted from parents to their children. The main purposes of the current study are to investigate: (a) the resemblance between

*Correspondence should be addressed to Dr Esther B. Isman, School of Education, Bar Ilan University, Ramat Gan 52900, Israel (e-mail: ismane@mail.biu.ac.il).

mothers' and grandmothers' use of MLE strategies; (b) the unique MLE strategies emphasized in each generation; and (c) the type and amount of mediation under two types of distinctive situations: free play versus structured.

The role of grandparents

The majority of people spend about one-third of their lives as grandparents (Smith, 1995), and grandparents are increasingly playing a significant role in the lives of their grandchildren (Mueller, Wilhelm, & Elder, 2002). Due to the sociological, political, and technological changes that occurred in the 20th century, grandparents live longer lives, and are able to have ongoing relationships with their grandchildren (Cherlin & Furstenberg, 1986; Nimkoff, 1961; Smith, 1989). Most grandparents see their grandchildren at least once a month, sometimes much more often; and generally the relationship is seen by both generations as positive and important. Spence, Black, Adams, and Crowther (2001) found that 60% of grandparents have frequent contact with their grandchildren and provide assistance by advising, preparing meals, and babysitting.

Vann (2005) identified two dimensions of grandparenting: (1) direct caregiving involving disciplining, supervision, teaching new skills, being patient with grandchildren, and putting effort into the grandparenting relationship and (2) practical assistance involving economic, household, and child-care assistance. According to Kalliopuska (1994), the grandparenting role is diverse; the grandparent provides the grandchild with love and affection, care, shelter, life experience, moral values, company, closeness, trust, aid, and support. The grandchild provides the grandparent with joy, inspiration, tenderness and love, contentment, life attitudes, closeness and company, and hope and faith for the future.

The range of activities that grandparents and grandchildren engage in during their interactions is wide. The majority of grandchildren report that their grandparents give them treats, share a sense of family, impart family history, take part in family events, play games, go on trips, babysit, make them feel good, help in an emergency, give personal advice, are there for them to talk to, join in religious activities, and give advice on school matters (Eisenberg, 1988). King and Elder (1998) found that education differentiated the types of roles that grandparents play. Some facets of grandparenting were more common among the less educated (contact, playing the role of the friend), while others were more common among grandparents with higher education (discussing the grandchild's future).

Today, grandparents have a significant role in the formation and growth of family relationships and in the intergenerational transmission of parenting skills (Smith, 1991). The level of grandparents' involvement with grandchildren is significantly influenced by grandparents having known their own grandparents (King & Elder, 1997). Most grandchildren perceive their grandparents as important influences in their lives. Wiscott and Kopera-Frye (2000) claim that grandparent-grandchild relationships are important vehicles for the transmission of cultural heritage, and that most grandchildren want grandparents to teach them their familial history. In addition, the majority of individuals, regardless of ethnicity or cultural background, incorporate these familial traditions into their lives.

Maternal grandmothers are perceived as closest and seen most often of all grandparents, followed by the maternal grandfather and the paternal grandparents (Battistelli & Farneti, 1991; Eisenberg, 1988; Hodgson, 1992; Hoffman, 1979; Kahana & Kahana, 1970; Shea, 1988; Smith, 1991; Tyszkowa, 1991). In addition, grandmothers perceive themselves to be significantly more involved in teaching their grandchildren and

directly raising them, more parental, more influential, and more successful in the grandparent role than grandfathers (Hayslip, Shore, & Henderson, 2000; Watson & Koblinsky, 1997). Although grandmothers generally work more today than in the past, their work does not seem to affect their relationship with their grandchildren. In many cases, the relationship is stronger than before (Walther-Lee, 1999). Therefore, in this research, we focused on the MLE strategies of the mother and the maternal grandmother, in order to study the possibility of transmission of the MLE strategies and to determine the unique qualities emphasized in each generation, to the benefit of the developing child.

The mediated learning experience (MLE) theory

This study is based on Feuerstein's theory of the *mediated learning experience* (MLE, Feuerstein & Feuerstein, 1991; Feuerstein, Rand, & Hoffman, 1979; Feuerstein *et al.*, 1980, 1988). Adequate MLE interactions facilitate the development of various cognitive functions, learning sets, mental operations, strategies and need systems. The child gradually internalizes these processes and they become an integrated mechanism of change. The more MLE the child receives, the more he or she is able to learn from direct exposure to formal and informal learning situations. The quality of parental mediation may indicate future changes in the child's cognitive structures, deficient cognitive functions, and the ability to benefit from mediation in other contexts (Feuerstein *et al.*, 1979; Tzuriel, 1999).

Tzuriel (1999) argued that the MLE criteria are comprehensive in the sense that they allow one to include, under the same theoretical umbrella, developmental aspects of parent-child interactions, diagnostic processes, educational intervention programmes, and sociocultural aspects of transfer of learning processes and value systems. The latter explains on the microlevel specific effects of mother-child interactions, and on the macrolevel describes transgenerational transmission of culture.

Feuerstein *et al.* (2002) suggested 13 criteria of the MLE, the first three of which were defined as necessary and sufficient for an interaction to be classified as MLE. These three are intentionality and reciprocity, meaning, and transcendence. These criteria are considered universal, while the other 10 are considered culturally related and task dependent. The following five MLE criteria were operationalized for infants and young children by Klein (e.g. 1988, 1996) and have been used extensively in several studies with infants (e.g. Klein & Aloni, 1993), preschool children (e.g. Tzuriel, 1996), schoolchildren (e.g. Tzuriel & Weiss, 1998), as well as in cross-cultural comparisons (e.g. Klein, 1996; Tzuriel, Kaniel, & Yehudai, 1994).

Intentionality and reciprocity refers to a mediator's intentional efforts to change the child's perception, processing, or response. Intentionality alone is insufficient unless accompanied by reciprocity. Reciprocity is observed when the child responds vocally, verbally, or non-verbally to the mediators' behaviour. Intentionality and reciprocity are observed, for instance, when a caregiver intentionally hands an object to the child or verbally focuses a child's attention and the child undoubtedly responds to that behaviour. This criterion is considered essential for the development of basic feelings of competence and self-determination.

Mediation of meaning refers to interactions in which the presented stimuli possess affective, motivational, and value-oriented significance. The stimuli are imbued with importance, value and worth, and not presented with a neutral approach devoid of affect. This can be conveyed non-verbally by facial expression, tone of voice, rituals, and repetitious actions. Verbally, it can be expressed by enlightening the present event,

activity, or learned context, relating it to the past or present events, and emphasizing its importance and value. The theory holds that children who experience mediation of meaning will actively connect meanings to new information rather than passively wait for the meaning to appear.

Mediation of transcendence refers to interactions in which the mediator goes further than the immediate and/or concrete needs of the children and tries to reach for goals that are beyond the specific situation or directly related to the original activity. In mother-child interactions, the mother goes beyond the actual experience by teaching strategies, rules, and principles in order to generalize to other situations. In a play situation, for instance, the mother might mediate the rules and principles that direct a game or an occurrence and show how they are generalized to other situations. Although transcendence depends on the first two criteria, intentionality/reciprocity and meaning, the combination of all three criteria becomes a powerful medium for the development of cognitive modifiability and for widening the individual's need system.

Mediation of feelings of competence is characterized by interactions in which a mediator conveys to a child that he/she is able to function independently and successfully. The mediator organizes the surroundings in order to supply opportunities for success, interpreting them to the child, and rewarding him/her for attempts to master the situation or deal effectively with problems. Feedback is provided not only for successful performance but also for attempts at mastery.

Mediation of control of behaviour is observed when a mediator regulates a child's response prior to the evident behaviour by either inhibiting impulsivity or by accelerating the behaviour, depending on the child's reactive style and the task demands. Control of behaviour can be mediated in a variety of ways such as analysing the task components, arousing awareness to task characteristics and suitable responses, modelling of self-control, and eliciting meta-cognitive strategies.

Many researchers have studied and shown the cognitive benefits of working with an adult who provides guidance and leadership throughout the learning experience (Goncu & Rogoff, 1998; Radziszewska & Rogoff, 1988), although most educational science is atheoretical, and lacks a list of principles that can be called a theory (Gallimore & Tharp, 1990). Feuerstein's work provides both a set of principles and a guiding theory. In addition, using the MLE approach, the mediator provides the interaction with the child a high level of flexibility. The MLE is responsive to individual differences in learning styles and needs. It moves away from merely giving task specific clues, and emphasizes adult communication of principles and strategies that children can generalize to new situations (Feuerstein *et al.*, 2002).

Feuerstein's MLE theory is in some aspects similar to Vygotsky's concepts of the *zone of proximal development (ZPD)* and *internalization*, which have captured the interest of many developmental psychologists and educators (Kozulin, 1990; Moll, 1990; Rogoff, 1990; Valsiner, 1984, 1987; van der Veer & Valsiner, 1993; van Geert, 1994; Wertsch, 1985; Wertsch & Tulviste, 1992). The ZPD is defined as the distance between a child's 'actual developmental level as determined by independent problem-solving' and the higher level of 'potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers' (Vygotsky, 1978, p.86). The potential developmental level becomes actual through the internalization mechanism. In other words, the child's initial performance is an external operation, which is transformed and becomes internal after a process of guidance by a more competent individual. For example, Moss and Strayer (1990) reported that the level of meta-cognitive competence of

gifted and non-gifted children during problem-solving with their mothers was related to (1) the quality of parental instruction; (2) the extent to which the child was able to benefit from adult assistance; and (3) a relational context that allows flexible and reciprocal negotiation of the roles. They also reported that the emergence of autonomous meta-cognitive strategies in the problem-solving of gifted children was preceded by mothers' direction of their children towards meta-cognitive processes. However, the way in which the children demonstrated ability for self-regulation during learning served as an important clue for the mothers about how quickly to progress within the children's ZPD. Vygotsky emphasized that caregivers must collaborate with children in joint cognitive activities carefully chosen to fit the child's level of potential development, thereby advancing the child's actual development (Wertsch & Rogoff, 1984). The difference, however, between Vygotsky's ZPD concept and Feuerstein's MLE is that the ZPD describes a structure or mental entity that exists at a certain distance from the individual's stage, whereas the MLE proposes the possibility that new structures are produced by MLE, and that without MLE they may not come into existence throughout the life of the individual.

Free-play versus structured situations

Vygotsky distinguished between two sources of the ZPD: *play* and *instruction*. In play, children create their own ZPD and corresponding level of potential development. On the other hand, in the context of instruction, the ZPD is created by a competent goal-oriented adult (intentionality in MLE theory terms) who mediates the world to the child. Similar distinctions between these two contexts have been made by van Geert (1994), Valsiner (1988), and Wertsch (1985).

The free-play and structured situations are conceptualized as representing two uniquely different conditions that affect children's cognitive development. These situations are hypothesized to represent typical and major parent-child interactions (Tzuriel, 1996). The free-play situation represents a frequent interactional pattern characterized by spontaneity, divergent thinking, free choice of task, lack of specific demands, relative lack of goals, and lack of externally imposed demands and structure. The MLE interactions are most likely to occur in such free-play situations at home, on the playground, or in the kindergarten classroom. The structured situation, on the other hand, represents conditions under which a caregiver is engaged in activity aimed at teaching a child how to perform or complete a task, solve a problem, or convey information and teach rules and principles. In these activities, the mediating adult must structure the situation and use more planning and higher 'mental investment' and 'mental tools' (Vygotsky, 1978).

Examining each mediators' interactions with the child in both free-play and structured situations is essential. In most cases, it is plausible to assume that grandmothers' interactions with their grandchildren are characterized mainly by spontaneous free play, whereas mothers' interactions with their children are characterized by both spontaneous free play and goal-oriented structured situations (Glazer, 1995).

Hypotheses

- (1) Based on Tzuriel's (1999) claim about the transgenerational transmission of MLE processes, we hypothesize an overall similarity between grandmothers' and mothers' MLE strategies.

- (2) The second hypothesis is that, in the structured situation, mothers (the primary caregiver) will provide more mediation for meaning, transcendence, and regulation of behaviour than grandmothers. This hypothesis is based on sociological evidence showing that the dominant grandparenting role is characterized mainly by caregiving and non-structured activities, although some evidence of disciplining, supervision, and teaching new skills was found (e.g. Kalliopuska, 1994; Vann, 2005).
- (3) In the free-play situation, we hypothesized that, in general, mothers and grandmothers will show similar patterns of the MLE strategies. However, due to the grandparenting role as transmitter of life experience and moral values (Kalliopuska, 1994), imparter of family history and cultural heritage, and provider of personal and educational advice (Eisenberg, 1988; Wiscott & Kopera-Frye, 2000), grandmothers will demonstrate more mediation for meaning and transcendence than mothers.

Method

Participants

The sample was composed of 52 urban Israeli families of maternal grandmothers (49–75 years old), mothers (25–45 years old), and kindergarten children (28 boys and 24 girls aged 5–6, mean = 5;6 years of age). In the sample, 30 mothers had 1–2 children (57.7%), 12 mothers had 3–4 children (23.1%), 5 mothers had 5–6 children (9.6%), and 5 mothers had 7 children or more (9.6%). Families were of medium to high socio-economic status. When compared with 58% of grandmothers, 33% of mothers had 12 years of education, whereas 67% of the mothers had a college degree as opposed to 42% of the grandmothers. Mothers' and grandmothers' mean ages were 33.67 ($SD = 5.04$) and 59.06 ($SD = 6.67$) years.

Measures

Observation of mediated interaction (OMI). The OMI (Klein, 1988; Klein, Weider, & Greenspan, 1987), based on Feuerstein's MLE theory, is composed of the five MLE criteria outlined above. These criteria were empirically defined and developed into an observation scale, providing a profile of mediation that is based on the frequency of appearance of the behaviours exemplifying each of the criteria (Klein & Aloni, 1993; Klein, Raziell, Brish, & Birenbaum, 1987). A higher frequency of mediated behaviours indicates a higher quality of mediation. Klein (1988) prefers to assess the quality of mother-child interaction by a *macroanalytic* rather than by a *microanalytic* approach. For example, when a parent focuses the child's attention on some aspects of a stimulus (handing an object to a child), it is coded as a behaviour reflecting *focusing* (intentionality and reciprocity) only if it is reciprocated by the child's response. Whenever the parent makes an attempt to generalize a rule, or suggest a concept or a principle that goes beyond the concreteness of the situation, it is coded as *expanding* (mediation of transcendence), regardless of the specific content being conveyed. The basis of the observation system is an interaction 'event' that might contain one or more MLE criteria. Klein argues that previous attempts to measure mother-child interactions (e.g. Clarke-Stewart, 1973, 1991; Yarrow, Rubenstein, & Pedersen, 1975) 'do not offer clear understanding of which behaviours occurring during parent-child interaction represent necessary and sufficient conditions for learning experience' (p. 56).

The advantages of the MLE molar observational approach are its allowance of the identification of meaningful patterns of continuity in parents' behaviour across a

developmental dimension. Sroufe (1983) argues that understanding of continuity in child development is not characterized by mere additions of behavioural components but rather on transformations and epigenesis. This approach coincides with other patterns such as emphasis on holism and the need to look at the meaning of behaviours within a psychological context rather than as isolated behaviours (Santostefano, 1978; Sroufe & Waters, 1977).

In the current study, the two raters observed the videotapes together and paused the tape after each interaction event. The event was then rated independently for the presence or absence of each mediation behaviour before proceeding to the next event. The behaviours in each event were mutually exclusive with no overlap among criteria. The length of each event varied, depending on the specific behaviour (e.g. an event indicating focusing may have taken a few seconds while an event indicating transcendence would take usually longer – as long as the explanation of a rule takes). The total frequency with which each mediation behaviour occurred across all events in the session was then calculated. Both observers were trained for 30 hours in rating mother-child interactions; training included theoretical understanding of the MLE criteria and mostly by observing and analysing videotapes depicting mother-child interactions. The training mother-child interactions were not included in the sample.

The OMI was adapted for the observation of kindergarten children by Tzuriel and has been used in a wide range of studies (Tzuriel, 1999; Tzuriel & Eran, 1990; Tzuriel & Ernst, 1990; Tzuriel & Hatzir, 1999; Tzuriel & Weiss, 1998; Tzuriel & Weitz, 1998). Satisfactory inter-rater reliabilities of the OMI are reported on samples of infants and toddlers (Klein & Aloni, 1993) and on kindergarten and school-age children (Tzuriel, 1999). Pearson correlations indicating inter-rater reliabilities of the MLE criteria (combined score of free-play and structured situations), based on 12 randomly selected dyads from the present sample were: intentionality and reciprocity, .87 ($p < .001$); meaning, .89 ($p < .001$); transcendence, .96 ($p < .001$); feelings of competence, .94 ($p < .001$); and regulation of behaviour, .91 ($p < .001$). In the current study, during the interaction, we added a sixth category, behaviours of closeness (i.e. smiles, laughter, different types of physical contact, nicknaming, and physical closeness). Inter-rater reliability for this category was .91 ($p < .001$).

Procedure

Dyads of mother-child and grandmother-child were observed in the relaxed and calm atmosphere of their homes, while interacting in two types of conditions: free play and structured. In all cases, the free play preceded the structured task in order to avoid possible effects due to the nature of the structured situation mentioned above. In the free-play condition, each adult was instructed to play with the child and was videotaped for 10 minutes. Each dyad was presented with a choice of games with which to play (i.e. various puzzles, tricky fingers, mazes, building pictures by models, drawing incomplete faces). All dyads were exposed to the same choice of games and no clear instructions were provided as to how to play with them. The only instruction provided to the adult was: 'you can do whatever you want with your child in the next 10 minutes, try to do what you are used to doing at home'. Choice of games by mother-child dyads was similar to the choice made by grandmother-child dyads.

During the structured situation, which followed immediately after the free-play situation and was also videotaped for 10 minutes, participants were provided with a specific problem-solving task (see below). Mothers and grandmothers were asked to

guide the child throughout the task, without being given instructions as to how to help the child. The tasks were explained to mothers (and separately to grandmothers), although no directions were given as to how to teach the child. During explanation, the child was playing in another corner of the room and was not exposed to the task explanation. When the mother/grandmother understood the tasks she was instructed to work with the child on solving them. In half of the cases mother-child dyads were observed first and in the other half grandmother-child dyads were observed first.

The task was composed of construction analogies from the *Children's Conceptual and Perceptual Analogical Modifiability (CCPAM) Test - Construction Version* (Tzuriel, 2002). The CCPAM items represent classical analogies in a pictorial modality. The problems are divided into two types: conceptual and perceptual analogies. In the *CCPAM Construction Version*, the child is given six pictures from which he/she must choose the four that construct the analogy and put aside the two irrelevant ones. The analogies were provided in a graduated level of difficulty. The perceptual analogies, which are easier to solve, were given prior to the more difficult conceptual analogies.

Results

The first objective of this study was to determine the resemblance between mothers' and grandmothers' frequencies of use of the six MLE strategies. We assume that a high resemblance may indicate transmission of the MLE processes. Pearson correlations were computed between mothers' and grandmothers' MLE criteria scores under both free-play and structured situations. Positive correlations between grandmothers' and mothers' MLE scores were found under both conditions. These correlations are presented in Table 1.

Table 1. Pearson correlations between grandmothers' and mothers' MLE criteria scores and behaviours ($N = 52$)

Measures	Free play	Structured	Fisher-Z
Intentionality and reciprocity	.24*	.26*	.15
Meaning	.16	.21	.25
Transcendence	.41**	.34*	.40
Feelings of competence	.18	.52***	1.98*
Control of behaviour	-.02	.25*	1.39
Behaviours indicating closeness	.35*	.45***	.54

* $p < .05$; ** $p < .01$; *** $p < .001$.

As can be viewed in Table 1 most correlations were found to be positively significant. The Fisher-Z analyses showed a significant difference between the correlations in the free-play and structured situation only for mediation for feelings of competence ($Z = 1.98, p < .05$).

The second and third objectives were to determine the differences between mothers' and grandmothers' mediation strategies as well as the differences between the free-play and structured situations. In order to study these differences, a 2×2 repeated measures MANOVA was carried out. The independent variables were mediator (mother vs. grandmother) and condition (free play vs. structured) and the dependent variables

were the frequencies of the six MLE criteria measured during the interaction. Significant differences were found between mediators ($F(6, 46) = 56.66, p < .001, \eta^2 = .88$) and conditions ($F(6, 46) = 3.06, p < .05, \eta^2 = .29$). A further significant mediator $\times$ condition interaction was found ($F(6, 46) = 3.04, p < .05, \eta^2 = .28$). Means and standard deviations of mothers' and grandmothers' MLE strategies and behaviours of closeness are presented in Table 2, along with the findings of the univariate ANOVA carried out to determine the differences between mothers and grandmothers in each criterion.

Table 2. Means, standard deviations, and univariate ANOVA of mothers' and grandmothers' mediation strategies and behaviours of closeness during MLE ($N = 52$)

Measures	Mothers		Grandmothers		$F(1, 50)$	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Intentionality and reciprocity	14.82	6.92	23.04	8.37	54.51***	.52
Meaning	0.53	0.85	2.59	2.13	54.55***	.52
Transcendence	2.75	2.37	9.76	3.84	227.91***	.82
Feelings of competence	12.34	5.90	11.22	4.24	2.08	.04
Control of behaviour	7.10	3.87	4.89	2.70	15.18***	.23
Behaviours indicating closeness	7.59	2.68	7.46	2.60	0.10	.00

Note. η^2 indicate partial Eta Square. *** $p < .001$.

As we can see in Table 2, grandmothers provided a higher level of mediation than mothers in intentionality and reciprocity (i.e. focusing), meaning (i.e. labelling, affect), and transcendence (i.e. expanding, rules). On the other hand, mothers provided a higher level of mediation of regulation of behaviour (i.e. inhibition of behaviour) than grandmothers. No differences were found in mediation of feelings of competence or in behaviours of closeness in either situation.

In order to determine the specific differences between free-play and structured conditions, a univariate ANOVA was carried out separately for each of the five MLE criteria and for behaviours of closeness. Significant differences were found for mediation for transcendence ($F(1, 51) = 15.61, p < .001, \eta^2 = .23$) and for behaviours indicating closeness ($F(1, 51) = 4.58, p < .05, \eta^2 = .08$). Mediation for transcendence was found to be higher during free-play ($M = 7.52, SD = 2.98$) than during the structured condition ($M = 4.99, SD = 3.69$). Similarly, behaviours indicating closeness were found to be higher during free-play ($M = 8.14, SD = 2.78$) than during the structured condition ($M = 6.91, SD = 3.20$).

In order to examine the significant interaction found for mediator $\times$ condition, an additional univariate ANOVA was carried out, indicating significance only for mediation of transcendence ($F(1, 51) = 14.52, p < .001, \eta^2 = .22$). This interaction is presented in Figure 1.

As shown in Figure 1, while under both conditions, grandmothers provided a higher level of mediation for transcendence than mothers, a greater difference was found during free play ($F(1, 51) = 175.26, p < .001, \eta^2 = .77$) than during the structured situation ($F(1, 51) = 42.33, p < .001, \eta^2 = .45$). Simple effects analyses were carried out in order to examine the differences between mothers and grandmothers level of

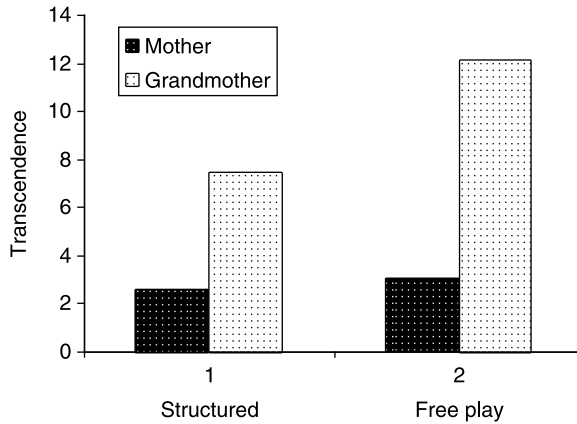


Figure 1. Interaction of condition $\times$ mediator during mediation for transcendence.

mediation for transcendence in each condition. A significant difference was found for grandmothers ($F(1, 51) = 18.05$, $p < .001$, $\eta^2 = .26$) but not for mothers ($F(1, 51) = 0.75$, $p > ns$).

Discussion

The first objective of this study was to investigate the resemblance between mothers' and grandmothers' level of MLE strategies. This resemblance may indicate whether or not mediation processes are passed on from one generation to another. The findings showed several correlations between grandmothers' and mothers' MLE criteria in both situations. In the structured situation, four criteria emerged as significant: *intentionality and reciprocity* ($r = .26$), *transcendence* ($r = .34$), *feelings of competence* ($r = .52$), and *regulation of behaviour* ($r = .25$). Thus, the more the grandmother mediated these criteria, the more these criteria were found in the mothers' mediation. Two of these MLE criteria emerged as significant during free play as well: *intentionality and reciprocity* ($r = .24$) and *transcendence* ($r = .41$). In addition, correlations were found between grandmothers' and mothers' *behaviours of closeness* with the child during the mediated interaction in both free-play ($r = .35$) and structured ($r = .45$) conditions. The resemblance between grandmothers' and mothers' level of MLE criteria and behaviours of closeness may indicate a certain level of transmission of MLE strategies from generation to generation.

The finding of more correlations between grandmothers' and mothers' level under the structured condition may be due to the differences between the two situations. During free play, the mediator is under no pressure to reach a specific goal and therefore the situation is process oriented and spontaneous. In contrast, in structured situations, the mediator must direct the child in order to reach a specific goal, therefore must plan his/her actions in order to guide the child and direct him/her during problem-solving. We may assume that, under structured conditions, the mediator is more aware of the need to choose adequate mediation strategies, and uses the strategies he/she was taught throughout his/her life experience. Thus, under structured conditions, mothers' MLE profiles have more in common with their own mothers' profiles.

In the current study, we presume that transmission explains the correlations found, although several alternative explanations must be acknowledged as well. One

alternative explanation of the correlation may be that the grandmothers' MLE style was affected by the mothers' MLE style with her children and not vice versa. Another possible explanation may be due to the fact that each dyad was viewed while interacting with the same child.

The second objective of this study was to determine the unique MLE strategies emphasized in each generation. Findings indicate that grandmothers tend to mediate intentionality (i.e. focusing) and reciprocity, meaning (i.e. labelling), and transcendence (i.e. expanding) more frequently than mothers. On the other hand, mothers tend to mediate regulation of behaviour more frequently than grandmothers. These results may be interpreted in two different ways.

- (a) Differences in the perceived role of mothers and grandmothers: motherhood, as a parental role, is perceived as highly responsible as far as educating children is concerned. For example, Seok-Hoon (2001) found that Singapore mothers believed it was most important to participate in academically related activities with their children and offer them guidance. We presume that this is caused by the high sense of responsibility the mother feels in order to guide her child and help him/her succeed. In contrast, grandmothers may perceive their role as involving less responsibility towards the grandchild's academic future. Glazer (1995), who conducted a study on Israeli parents and grandparents, found that on the whole, grandparents do not wish for their grandchildren to succeed more than their peers but instead regard their feelings of happiness and normality to be of greater importance. This supports our interpretation of the findings. Grandmothers prefer to provide more mediation of meaning and transcendence, and less regulation of behaviour.
- (b) Differences in experience: grandmothers are more experienced mediators than mothers. Grandmothers intuitively know what the child needs in order to learn effectively; therefore, they provide the needed mediation and choose to elaborate mediation of meaning and transcendence. This possibility is supported by the fact that grandmothers offer similar levels of mediation to both boys and girls, whereas mothers provide boys with a higher level of mediation. Furthermore, mothers of families of many children mediate to a greater extent than mothers of fewer children (Isman, 2006). These findings support the explanation that MLE processes are enhanced by experience.

The third objective of this study was to determine whether or not the level of MLE strategies depends on the conditions (free play vs. structured) under which the mediation takes place. Grandparents' interactions with their grandchildren usually take place during free play. On the other hand, mothers interact with their children both during free-play and structured situations. Significant differences were found between the level of mediation of transcendence and the level of behaviours of closeness during free play and the interactions held under structured conditions. These factors were found more frequently during free play. These findings are explained by the differences between each situation. During free play, characterized by a lower level of sense of responsibility towards achieving a specific goal, the mediator is free to expand beyond the here and now. There is less need for regulation of behaviour and the interaction allows less tension and more behaviours of closeness.

These findings are unlike the findings of Tzuriel and Weiss (1998) or Tzuriel and Ernst (1990) who found higher levels of mediation of transcendence under structured

conditions than during free play. They argue that the higher level of mediation of transcendence found under the structured conditions is due to the high level of responsibility of the mediator to help the child reach the goal. The differences between these findings may be due to the different conditions under which each study took place. Both Tzuriel and Weiss (1998) and Tzuriel and Ernst (1990) videotaped the interactions in kindergarten or school, both of which represent formal institutions of education. The current research was conducted in the child's home, in a more relaxed atmosphere. The surroundings in which the interaction took place, therefore, may have affected the level of MLE strategies provided. Interactions taking place in a formal institution of education may tend to be characterized by the mediators' need to expand the child's cognitive awareness. On the other hand, interactions taking place in a home may allow the mediator to expand beyond the here and now and broaden the child's horizons.

In addition, the children in this study were aged 5–6 in kindergarten. The participants in Tzuriel and Weiss's study were 7–8 years old, and studied in the second grade. Hence, differences in the levels of mediation of transcendence found in each study may be explained by the developmental differences between the participants in each study. We may presume that mediating transcendence with younger children and broadening their horizons is possible on a higher level during free play in a calm and relaxed atmosphere, whereas mediating transcendence with older schoolchildren, who are accustomed to specific rules and guidance, is preferable under conditions more similar to school.

Another difference between the studies is the participants' socio-economic level. Most of the families willing to take part in this study were of medium SES or higher, whereas the families who took part in prior studies were of lower SES levels. In a previous study, Tzuriel and Ernst (1990) found that mothers' SES level predicted the use of four MLE strategies. The higher the SES of the mother, the higher her use of intentionality and reciprocity, meaning, transcendence, and feelings of competence.

In conclusion, we suggest that the issue of how mediation varies as a function of SES, education, and cultural background in an intergenerational perspective is an important one that should be explored in further cross-cultural studies. Further promising approaches include intervening to enhance MLE processes with parents and using experimental and control groups to evaluate the relative impact of different mediation strategies on children's cognitive development.

References

- Battistelli, P., & Farneti, A. (1991). Grandchildren's images of their grandparents: A psychodynamic perspective. In P. K. Smith (Ed.), *The psychology of grandparenthood: An International perspective* (pp. 143–156). London: Routledge.
- Berk, L. E., & Spuhl, S. T. (1995). Maternal interaction, private speech, and task performance in preschool children. *Early Childhood Research Quarterly*, 10, 145–169.
- Bornstein, M. H. (1985). How infant and mother jointly contribute to developing cognitive competence in the child. *Proceedings of the National Academy of Science*, 82, 7070–7073.
- Bornstein, M. H. (1989a). Between caretakers and their young: Two models of interaction and their consequences for cognitive growth. In M. H. Bornstein & J. S. Bruner (Eds.), *Interaction in human development* (pp. 197–214). Hillsdale, NJ: Erlbaum.
- Bornstein, M. H. (1989b). Cross-cultural developmental comparisons. *Developmental Review*, 9, 171–204.

- Bornstein, M. H., Azuma, H., Tamis-LeMonda, C., & Ogino, M. (1990). Mother and infant activity and interaction in Japan and the United States: I. A comparative macro analysis of naturalistic exchanges. *International Journal of Behavioral Development*, 13, 267-288.
- Cherlin, A. J., & Furstenberg, F. E., Jr. (1986). *The new American grandparent*. New York: Basic.
- Clarke-Stewart, K. A. (1973). Interactions between mothers and their young children: Characteristics and consequences. *Monographs of the Society for Research in Child Development*, 38 (Serial no. 153), 6-7.
- Clarke-Stewart, K. A. (1991). Developmental psychology in the real world: A paradigm of parent education. In F. S. Kessel, M. H. Bornstein, & A. J. Sameroff (Eds.), *Contemporary constructions of the child* (pp. 179-194). Hillsdale, NJ: Erlbaum.
- Eisenberg, A. R. (1988). Grandchildren's perspectives on relationships with grandparents: The influence of gender across generations. *Sex Roles*, 19, 205-217.
- Feuerstein, R., & Feuerstein, S. (1991). Mediated learning experience: A theoretical review. In R. Feuerstein, P. S. Klein, & A. J. Tannenbaum (Eds.), *Mediated learning experience (MLE)* (p. 352) London: Freund.
- Feuerstein, R., Feuerstein, R. S., Falik, L. H., & Rand, Y. (2002). *The dynamic assessment of cognitive modifiability: The learning propensity assessment device, theory, instruments, and techniques*. Jerusalem: ICELP Press.
- Feuerstein, R., Klein, P. S., & Tannenbaum, A. J. (Eds.), (1991). *Mediated learning experience (MLE) theoretical, psychosocial and learning implications*. London: Freund Publishing House.
- Feuerstein, R., Rand, Y., & Hoffman, M. B. (1979). *The dynamic assessment of retarded performers*. Baltimore: University Park Press.
- Feuerstein, R., Rand, Y., Hoffman, M. B., & Miller, R. (1980). *Instrumental enrichment*. Baltimore, MD: University Park Press.
- Feuerstein, R., Rand, Y., & Rynders, J. E. (1988). *Don't accept me as I am*. New York: Plenum Press.
- Gallimore, R., & Tharp, R. (1990). Teaching mind in society: Teaching, schooling, and literate discourse. In L. C. Moll (Ed.), *Vygotsky and education: Instructional implications and applications of sociobistorical psychology* (pp. 175-205). New York: Cambridge University Press.
- Goncu, A., & Rogoff, B. (1998). Children's categorization with varying adult support. *American Educational Research Journal*, 35, 333-349.
- Glazer, Z. (1995). *The nature of the mediational interaction between grandparents and grandchildren*. Unpublished manuscript, School of Education, Bar-Ilan University, Ramat Gan, Israel.
- Hayslip, B. Jr., Shore, R. J., & Henderson, C. E. (2000). Perceptions of grandparents' influence in the lives of their grandchildren. In B. Hayslip Jr. & G. R. Goldberg (Eds.), *Grandparents raising grandchildren: Theoretical, empirical, and clinical perspectives* (pp. 35-46). New York: Springer Publishing.
- Hodgson, L. G. (1992). Adolescent grandchildren and their grandparents: The enduring bond. *International Journal of Aging and Human Development*, 34(3), 209-225.
- Hoffman, E. (1979). Young adults' relations with their grandparents: An exploratory study. *International Journal of Aging and Human Development*, 10, 299-310.
- Isman, E. (2006). *The effects of attachment, well-being and religious orientation on the mediated learning pattern in a three generational perspective*. Unpublished manuscript, School of Education, Bar-Ilan University, Ramat Gan, Israel.
- Kahana, B., & Kahana, E. (1970). Grandparenthood from the perspective of the developing grandchild. *Developmental Psychology*, 3, 98-105.
- Kalliopuska, M. (1994). Relations of retired people and their grandchildren. *Psychological Reports*, 75(3, Pt 1), 1083-1088.

- King, V., & Elder, G. H. Jr. (1997). The legacy of grandparenting: Childhood experiences with grandparents and current involvement with grandchildren. *Journal of Marriage and the Family*, 59(4), 848-859.
- King, V., & Elder, G. H. Jr. (1998). Education and parenting roles. *Research on Aging*, 20(4), 450-474.
- Klein, P. S. (1988). Stability and change in interaction of Israeli mothers and infants. *Infant Behavior and Development*, 11, 55-70.
- Klein, P. S. (Ed.). (1996). *Early intervention: Cross cultural experiences with a medeational approach*. New York: Garland.
- Klein, P. S., & Aloni, S. (1993). Immediate and sustained effects of maternal mediation behaviors on young children. *Journal of Early Intervention*, 17, 1-17.
- Klein, P. S., Raziell, P., Brish, M., & Birenbaum, E. (1987). Cognitive performance of 3 year olds born at very low birth weight. *Journal of Psychosomatic Obstetrics and Gynecology*, 7, 117-129.
- Klein, P. S., Weider, S., & Greenspan, S. I. (1987). A theoretical overview and empirical study of mediated learning experience: Prediction of preschool performance from mother-infant interaction patterns. *Infant Mental Health Journal*, 8, 110-129.
- Kozulin, A. (1990). *L.S. Vygotsky*. Baltimore, UK: Harvester Press.
- Moll, L. C., (Ed.) (1990). *Vygotsky and education: Instructional implications and applications of sociobistorical psychology*. Cambridge, UK: Cambridge University Press.
- Moss, E. S. & Strayer, F. F. (1990). Interactive problem-solving of mothers and gifted and nongifted preschoolers. *International Journal of Behavioral Development*, 13, 177-197.
- Mueller, M. M., Wilhelm, B., & Elder, G. H. Jr. (2002). Variations in grandparenting. *Research on Aging*, 24(3), 360-388.
- Nimkoff, M. F. (1961). Changing family relationships of older people in the US during the last fifty years. *Gerontologist*, 1, 92-97.
- Radziszewska, B., & Rogoff, B. (1988). Influence of adult and peer collaborators on children's planning skills. *Developmental Psychology*, 24, 840-848.
- Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development and social context*. New York: Oxford University Press.
- Santostefano, S. (1978). *A biodevelopmental approach to clinical child psychology*. New York: Wiley.
- Seok-Hoon, A. S. (2001, December). *Parental involvement in child assessment: A dynamic approach*. Paper presented at the Australian Association for Research in Education International Conference.
- Shea, L. P. (1988). Grandparent-adolescent relationships as mediated by lineage and gender (Doctoral dissertation Virginia Polytechnic Institute and State University, 1987). *Dissertation Abstracts International*, 49, 351-358.
- Smith, M. S. (1991). An evolutionary perspective on grandparent-grandchild relationships. In P. K. Smith (Ed.), *The psychology of grandparenthood: An international perspective* (pp. 157-176). London: Routledge.
- Smith, P. K. (1989). *Grandparenting in today's world*. Hogg Foundation for Mental Health. University of Texas. Austin, TX, 78713-7998.
- Smith, P. K. (1995). Grandparenthood. In M. H. Bornstein (Ed.), *Handbook of parenting* (Vol. 3, pp. 89-112). Mahwah, NJ: Erlbaum.
- Spence, S. A., Black, S. R., Adams, J. P., & Crowther, M. R. (2001). Grandparents and grandparenting in a rural southern state: A study of demographic characteristics, roles, and relationships. *Journal of Family Issues*, 22(4), 523-534.
- Sroufe, L. A. (1983). Infant-caregiver attachment and patterns of adaptation in preschool: The roots of maladaptation and competence. In M. Perlmutter (Ed.), *Minnesota Symposia in Child Psychology* (Vol. 16, pp. 41-83). Hillsdale, NJ: Erlbaum.
- Sroufe, L. A., & Waters, E. (1977). Attachment as an organizational construct. *Child Development*, 48, 1184-1199.

- Tyszkowa, M. (1991). The role of grandparents in the development of grandchildren as perceived by adolescents and young adults in Poland. In P. K. Smith (Ed.), *The psychology of grandparenthood: An international perspective* (pp. 50–67). Routledge: London.
- Tzuriel, D. (1996). Mother-child mediated learning strategies in free-play and structured situations among low, medium, and high SES levels. *Child Development and Care*, 126, 57–82.
- Tzuriel, D. (1999). Parent-child mediated learning interactions as determinants of cognitive modifiability: Recent research and future directions. *Genetic, Social and General Psychology Monographs*, 125, 109–156.
- Tzuriel, D. (2001). *Dynamic assessment of young children*. New York: Kluwer Academic/Plenum Press.
- Tzuriel, D. (2002). *Children's Conceptual and Perceptual Modifiability (CCPAM) Test-Construction Analogies Version*. School of Education, Bar-Ilan University.
- Tzuriel, D., & Eran, Z. (1990). Inferential cognitive modifiability of Kibbutz young children as a function of mother-child mediated learning experience (MLE) interactions. *International Journal of Cognitive Education and Mediated Learning*, 1, 103–117.
- Tzuriel, D., & Ernst, D. (1990). Cognitive modifiability of young children and mother child mediated learning experience (MLE) interaction in low, medium and high SES. *International Journal of Cognitive Education and Mediated Learning*, 1, 119–135.
- Tzuriel, D., & Hatzir, A. (1999). *The effects of mediational strategies of mothers and fathers and amount of time they spent with their young children on children's cognitive modifiability*. Unpublished manuscript, School of Education, Bar-Ilan University, Ramat Gan, Israel.
- Tzuriel, D., Kaniel, S., & Yehudai, M. (1994, July). *Mediated learning experience (MLE) interactions among Ethiopian immigrant and Israeli-born mothers*. Paper presented at 12th International Congress of the International Association for Cross-Cultural Psychology, Pamplona, Spain.
- Tzuriel, D., & Weiss, S. (1998). The effects of mothers' acceptance/rejection attitudes, children's personality and mothers' mediated learning strategies on cognitive modifiability. *Early Development and Parenting*, 7, 79–99.
- Tzuriel, D., & Weitz, A. (1998). *Cognitive modifiability as a function of mother-child mediated learning strategies among very low birth weight and normally born children*. Unpublished manuscript, School of Education, Bar-Ilan University, Ramat Gan, Israel.
- Valsiner, J. (1984). Construction of the zone of proximal development in adult-child joint interaction: The socialization of meals. In B. Rogoff & J. V. Wertsch (Eds.), *Children's learning in the 'zone of proximal development' New direction in child development* (Vol. 23, pp. 65–76). San Francisco: Jossey-Bass.
- Valsiner, J. (1987). *Culture and the development of children's action*. New York: Wiley.
- van der Veer R., & Valsiner, J. (1993). *A quest for synthesis: Life and work of Lev Vygotsky*. London: Routledge.
- Valsiner, J. (1988). *Developmental psychology in the Soviet Union*. Brighton: Harvester.
- van Geert, P. (1994). Vygotskian dynamics of development. *Human Development*, 37, 346–365.
- Vann, M. S. (2005). Grandparenting as a functional experience within the extended family. *Dissertation Abstracts International*, 65(11-B), 6035.
- Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Wachs, C. D. (1992). *The nature of nurture*. Newborn Park, CA: Sage.
- Wertsch, J. V. (1985). *Culture, communication and cognition: Vygotskian perspectives*. New York: Cambridge University Press.
- Wertsch, J. V., & Rogoff, B. (1984). Editor's notes. In B. Rogoff & J. V. Wertsch (Eds.), *Children's learning in the 'zone of proximal development'* (pp. 1–6). San Francisco, CA: Jossey-Bass.
- Wertsch, J. V., & Tulviste, P. (1992). L.S. Vygotsky and contemporary development psychology. *Developmental Psychology*, 28, 548–557.
- Walther-Lee, D. (1999). The changing role of grandparents: Adult children's memories of their grandparents. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 60(2-B), 0877.

- Watson, J. A., & Koblinsky, S. A. (1997). Strengths and needs of working-class African-American and Anglo-American grandparents. *International Journal of Aging and Human Development*, 44(2), 149-165.
- Wiscott, R., & Kopera-Frye, K. (2000). Sharing of culture: Adult grandchildren's perceptions of intergenerational relations. *International Journal of Aging and Human Development*, 51, 33-49.
- Yarrow, L. J., Rubenstein, J. L., & Pedersen, F. A. (1975). *Infant and environment*. New York: Wiley.

Received 8 May 2007; revised version received 6 December 2007