

Do Children Do as Parents Do?: Parents' and Pre-School Children's Knowledge, Attitudes and Practices on Waste Segregation

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Abstract

This study determined the knowledge, attitude, and practices (KAP) of parents and children on waste segregation and if the parents' KAP influence the children's KAP. Fifty-six pupils at a preschool laboratory were administered a pictorial interview schedule. The parents accomplished a self-administered questionnaire. The correlation coefficients were generated to determine relationships between children's age and sex to their KAP and parents' KAP and children's KAP. Regression analysis was done to determine parents' and children's KA contribution to their P. Findings show that majority of the parents and nearly half of the children have high KAP scores. As children's age increases, their KAP slightly increases. Girls have slightly higher KAP than boys. For parents, knowledge was a predictor of practice while for children, attitude was a predictor for practice. There is a weak positive relationship between children's and parents' KAP. Parents' P is also the biggest contributor to the children's KAP. The family is an influential agent for children's sustainable development practices.

Keywords : attitudes, children, knowledge, parents, practices, waste segregation

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Introduction

Republic Act No. 9003 (2001) defines solid waste as “all discarded household, commercial waste, non-hazardous institutional and industrial waste, street sweepings, construction debris, agricultural waste, and other non-hazardous/non-toxic waste.” Solid waste management (SWM) in the Philippines has remained a major concern due to improper waste disposal, problems in waste collection, and the lack of waste disposal facilities (Senate Economic Planning Office [SEPO], 2017). In 2016, the country generated around 40,000 tons waste per day (SEPO, 2017) and this is expected to increase over time. Unsanitary and improper disposal of wastes pose an environmental challenge and threaten the family’s health and welfare. Thus, waste management must be implemented so households can maintain the constituents’ quality of life.

The family should be the first to implement and practice solid waste management (SWM) in their homes. SWM should begin where wastes are generated and be managed by household members, young and old. Parents are the major socialization agents who help children develop beliefs, values, attitudes, and knowledge (Pate, 2012) on various concepts in the context of a secure attachment bond. Thus, each family member must be knowledgeable and capable in performing SWM tasks.

Knowledge, attitudes, and practices are entwined constructs. Practices entail the application of knowledge gained and valuing knowledge may help in one’s application of it (National Academies of Sciences, Engineering, and Medicine, 2016). While knowledge is crucial to performance, it is not sufficient to lead one to correct actions (Pfeffer & Sutton, 2000). There are other factors which motivate a person to act on that knowledge. A person’s knowledge, verbal commitment, and sense of responsibility affect the level of consistency between one’s environmental attitudes and behaviors (Hines et al., 1987). Turning knowledge and attitudes to behavior is also influenced by lifestyle. Even though people profess to having the right environmental knowledge and attitudes, they may be reluctant to change their lifestyle or compromise their comfort and convenience for the environment’s sake.

Recent studies investigated knowledge, attitudes, and practices (KAP) of adults at the household level. Porathoor and Vincent (2020) found that only 46.4% of the households

know about waste segregation. Kaithery and Karunakaran (2019) found that 94% of the households in their study had above average attitude towards household waste management and were willing to engage in waste composting, segregation, and recycling. Similarly, Cheng et al. (2020) found that households had a favorable attitude towards solid waste segregation and a high intention level to practice it. However, Mukemo et al. (2020) found that only 11.2% of the households practiced waste segregation into biodegradable and non-biodegradable wastes.

There have been studies done on children's environmental knowledge, attitudes, and behaviors. Ergazaki et al. (2009) found that only 25% of the preschoolers had a personal experience of garbage segregation in their homes. In more recent studies, findings were more favorable. Borg (2017) showed that by 6 years of age, preschoolers have knowledge about sorting different recyclable items and as understanding of sustainability issues increased, so did self-reported sustainability practices. Recently, Mahat et al. (2019) found that, among their preschool respondents, knowledge to recognize recyclable and non-recyclable materials was not good but overall knowledge of sustainability was quite good, overall attitude to sustainability was good, and sustainability practices were high. Kahrman-Öztürk et al. (2012), in their review of the literature, reported that preschool children can learn about environmental concepts and sustainability through a project approach or activities which is more concrete, sensorial, and experiential or hands-on.

The adult/parents' knowledge, attitudes, and practices play an important role in teaching, modelling, and reinforcing SWM concepts to their children. Borg (2017) presented the parents as the main sources of children's knowledge although there were other sources such as the teachers, media, and the children themselves. Grodzinska-Jurczak et al. (2006) found that more than half of the parents practiced waste segregation but only 30% of the children did so. Still, they said that parents' behaviors have an impact on their child's environmental knowledge and attitudes. If children learn the right SWM knowledge, attitudes, and practices during the formative years of life, these will lay the foundation in forming their values towards the environment until they become integral members of their community in the future.

The Social Learning Theory offers a useful perspective from which to view the relationship between parents' KAP and children's KAP. Aside from content knowledge, Bandura (1977)

emphasized how individuals learn skills and behaviors from significant people in a social context through modelling of a behavior and reinforcement. By means of the parents' behaviors as a model, children may sense and observe the expectations of parents for certain behaviors, including pro-environmental behaviors (Yorifuji, 2003). Individuals, even children, cognitively process observations as they participate in social interactions. Thus, parents' waste segregation practices at home may influence children's waste segregation practices as these are modelled at home and observed by the children.

This study determined whether parents' KAP and children's KAP on waste segregation are related. Specifically, the study aimed to answer the following questions:

1. What are the parents' and children's KAP on waste segregation?
2. What are the relationships between children's age, sex and KAP?
3. What is the contribution of parents' knowledge and attitude (KA) to their practice (P) on waste segregation?
4. What is the contribution of children's knowledge and attitude (KA) to their practice (P) on waste segregation?
5. What is the relationship between parents' and child's KAP on waste segregation?

It is hypothesized that parents' KAP and child's KAP are related. Parents who know, value, and engage in waste segregation practices can influence their child/children's knowledge, attitudes, and practices in waste segregation. The Social Learning Theory posits that children learn certain behaviors due to observing others who are performing those behaviors and seeing these behaviors reinforced (Bandura, 1977). Even personality characteristics and skills develop as the child undergoes various experiences in the context of the early social milieu, which is the family and specifically, the parents (Leff et al., 2009). Children grow up with parents who have beliefs, values, attitudes, and practices. Over time, they may internalize these through their frequent or regular interactions with their parents (Zimmerman, 2001). If the parents define waste segregation as a good and necessary pro-environmental practice, this may make more likely the child's engagement in waste segregation practices.

This study can help better understand the relationship of knowledge and attitudes to practices for both parent and child. It can also suggest ways on how parents can strengthen their KAP and their children's KAP on waste segregation. Further, it can be a basis for

intervention activities for children to learn the habit of waste segregation from their parents and other significant information sources such as extended family members and school personnel. The significance of translating knowledge and attitudes to sustainable practices has great implications for the well-being of the environment and its inhabitants, especially, for children who will take over the stewardship later in life.

Methodology

This is a quantitative study with a cross-sectional design, gathering data from the parents and their child(ren) at one point in time. It should be noted that with this design, relationships can be observed but causality is unclear or cannot be determined. Results can only be generalized for this specific sample but may provide data for benchmarking studies.

Respondents

This study was conducted at the laboratory preschool of the national university in Region IV-A, Calabarzon, Philippines. This region was the second top generator of solid wastes after the National Capital Region, producing 4,400 tons per day (SEPO, 2017). The preschool was in a suburban town to the south of the National Capital Region. The participants include Filipino children attending this preschool laboratory. The school had a population of 60 pupils: the Nursery class has 20 pupils, and the two Prekindergarten classes have 40 pupils. Complete enumeration was done to provide a true measure of the population. Since it is a laboratory preschool, parents are informed beforehand that they may become respondents for studies, and they also gave their consent. Letters were sent through the Faculty-in-Charge and teachers about the participation in this study. The respondents were 56 pupils aged 4-5 years old and their parents (83.33% response rate).

Research Instrument

A questionnaire was developed with two parts. The first part collected socio-demographic information. The second part was the measurement of the KAP on waste segregation with 10

questions each per domain for a total of 30 items. The questions were adapted from Sumayao and De Guzman (2007) and Tatlonghari and Jamias (2010). A Guttman 2-point scale was used where each correct answer was scored with 1 point and an incorrect answer was scored with 0. The knowledge domain used a 2-point True or False format; the attitude domain used a 2-point Agree or Disagree format; and practice domain used a 2-point Yes or No format. Examples for the items are as follows: Wastes are segregated to lessen volume of wastes brought to dumpsite [Knowledge domain]; I should keep/reuse some solid waste [Attitude domain]; and I sell recyclables to junk collectors [Practice domain].

The content of the questionnaire for the parents was also used for the children but in a pictorial format. Pictorial interview protocols for preschoolers have been used in various studies to assess environmental concepts and behaviors (Alici, 2013; Borg, 2017; Mahat et al., 2019). The pictorial format for the preschoolers was first drafted and was validated by three experts for its clarity, content, and appropriateness for preschoolers. One expert was in the field of human and child development, another was in child and family ecology, and another was in communication. After the required modifications were made, this was pretested with preschoolers from another laboratory preschool program not part of the sample to test for reliability and validity. Appendix A gives some examples of the pictured items used per domain.

Data Collection

The informed consent form was given to the parents along with the letter about their participation in the study. The parents gave their informed consent prior to data collection. During data collection, the children were first interviewed before the parents. The children were interviewed in an empty room at the preschool to avoid distractions. When all children were interviewed, the questionnaires were distributed to the parents and were collected after a week. It is also to be noted that no lesson/activity on waste segregation was done at school prior to the data collection.

Data Analysis

Descriptive statistics were computed to describe the respondents' socio-demographic attributes and KAP. The children's and parents' KAP responses were tabulated and scored using a scoring guide developed for the study to determine low and high scorers. Difference in KAP between parents and their children was determined using their summative scores. To determine the relationship between children's age and sex and KAP, Spearman's correlation coefficient was used. Regression analysis was done to determine both parents' and children's knowledge-attitude contribution to practice. Lastly, Pearson's correlation coefficient was generated to determine the relationships between parents' KAP and child's KAP.

Results

Sociodemographic Characteristics

Tables 1 and 2 show the respondents' socio-demographic characteristics. Most of the

Table 1. *Family Role, Family Size and Monthly Gross Income of Respondents*

Sociodemographic Characteristics	F	%
Family role		
Mother	47	83.93
Father	9	16.07
Family Size		
2	3	5.35
3	16	28.57
4	24	42.86
5	11	19.64
6	2	3.57
Monthly Gross Income (Php)		
0-20,000	4	7.14
20,001-40,000	11	19.64
40,001-60,000	9	16.07
60,001-80,000	12	21.43
80,001-100,00	2	3.57
100,00 & above	7	12.50
No Answer	11	19.64

parent-respondents are mothers. More than half of them were 30-39 years old. Almost half of the respondents have four family members. Nearly three-fourths of the families have a monthly income of more than Php20,000, meaning, they are from middle-income families. This may be significant since households with higher incomes are less likely to engage in waste segregation for reasons like being able to afford waste collection services (Banga, 2011). There was slightly more girl than boy pupils. Two-thirds of the children were 5 years old.

Table 2. *Parents' Educational Attainment, Parental Age and Children's Age*

Socio-demographic Characteristics	<i>F</i>	%	<i>F</i>	%	<i>Total F</i>	<i>Total%</i>
Educational Attainment	Father		Mother			
HS Graduate	2	3.92	0	0.00	2	1.87
Vocational Course	0	0.00	1	1.78	1	0.94
College Graduate	32	62.75	31	55.36	63	58.87
Post-Graduate	17	33.33	24	42.86	35	32.71
Parents' Age						
20-29	10	19.61	14	25.00	24	22.42
30-39	28	54.90	35	62.50	63	58.87
40-49	13	25.49	7	12.50	20	18.69
Children's Age	Boy		Girl			
4	9	33.33	10	34.48	19	33.93
5	18	66.67	19	65.52	37	66.07

Parents' KAP on Waste Segregation

Majority of the parents' scores (96.43%) are in the high level for waste segregation (Table 3). Table 4 shows the mean score of 26.78 ($SD=2.72$) for the three domains of knowledge, attitude, and practices, is in the high level. The parents' mean attitude score for waste segregation ($M=9.87$, $SD=0.44$) is slightly higher than their scores in knowledge ($M=9.46$, $SD=0.61$) and practice ($M=7.63$, $SD=2.18$).

Children's KAP on Waste Segregation

Less than half of the children (42.86%) scored in the high level for waste segregation

(Table 3). The children's mean score was 17.82 ($SD=2.7$) for the three domains of knowledge, attitude, and practices, which is in the middle level. Children's mean attitude score for waste segregation ($M=6.42$, $SD=2.75$) is slightly higher than their scores in knowledge ($M=5.68$, $SD=2.68$) and practice ($M=5.81$, $SD=2.88$).

Table 3. *Distribution of Parents' and Children's KAP Scores*

KAP Score	F	%
Parents		
LOW (0-10 pts)	0	0.00
MID (11-20 pts)	2	3.57
HIGH (21-30 pts)	54	96.43
TOTAL	56	100.00
Children		
LOW (0-10 pts)	11	19.64
ID (11-20 pts)	21	37.50
HIGH (21-30 pts)	24	42.86
TOTAL	56	100.00

Table 4. *Mean and Standard Deviation of Parents' KAP Scores*

	Knowledge		Attitude		Practice		Total	
	Parents	Children	Parents	Children	Parents	Children	Parents	Children
Mean	9.46	5.68	9.87	6.42	7.63	5.81	26.78	17.82
Standard Deviation	0.61	2.68	0.44	2.75	2.18	2.88	2.72	7.32

Relationship Between Children's KAP and Age and Sex

There is a very weak positive correlation between children's KAP and their age ($r=.102$, n.s.). Also, there is a very weak positive correlation between children's KAP and their sex ($r=.074$, n.s.) (Table 5). These relationships were not significant, however.

Table 5. *Spearman's Correlation Coefficient between Children's KAP and their Age and Sex*

Characteristic	Correlation coefficient
Age	0.102
Sex	0.074

$p<.05$

Contribution of Parents' Knowledge-Attitude to their Practice

The overall regression model for the parents is not significant, as indicated by the ANOVA test ($F=3.012$, $p=.058$) (Table 6). However, keeping the effect of the parents' Attitude constant, the Knowledge ($t = -2.090$, $p=.042$) is a significant predictor of the parents' practice (Table 7). While Knowledge has a negative value, only the absolute value will be considered. While the overall regression model is insignificant, the Knowledge and Attitude of parents individually affect their waste segregation practices. The standardized coefficients of Knowledge (-.293) and Attitude (.260) indicate comparable effects on waste segregation practices.

Table 6. *Regression Results of Parents' Knowledge and Attitude to Practice*

ANOVA ^b						
	Model	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
1	Regression	26.867	2	13.433	3.012	.058 ^a
	Residual	223.020	50	4.460		
	Total	249.887	52			

^aPredictors: (Constant), Att of Parent, K of Parent

^bDependent Variable: Practice of Parent

Table 7. *Regression Results of Parents' Knowledge and Attitude to Practice*

		Coefficients ^a				
Model		<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>		
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>
1	(Constant)	4.896	7.112		.688	.494
	K of Parent	-1.058	.506	-.293	-2.090	.042*
	Att of Parent	1.294	.698	.260	1.855	.070

^aDependent Variable: Practice of Parent

Contribution of Children's KA to P

The overall regression model for the children is significant, as indicated by the ANOVA test ($F=9.049, p=.000$) (Table 8). However, among the predictor variables, only the child's Attitude ($t=2.197, p=0.033$) is a significant predictor of the child's practice. The regression result in Table 9 also shows that children's Attitude is more influential than Knowledge in their waste segregation practices. Like the parents, a more positive attitude results in a more favorable practice. Unlike the parents, however, the knowledge scores of children do not significantly affect their waste segregation Practice scores, whether positively or negatively. Overall, the pattern suggests that regardless of whether it is the parent or child, it is the Attitude that consistently affects the respondents' waste segregation practices.

Table 8. *Regression Results of Children's Knowledge and Attitude to Practice*

ANOVA ^b					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	115.285	2	57.642	9.049	.000 ^a
Residual	324.863	51	6.370		
Total	440.148	53			

^aPredictors: (Constant), Attitude of Child, K of Child

^bDependent Variable: Practice of Child

Table 9. *Regression Results of Children's Knowledge and Attitude to Practice*

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients		
	(Constant)	2.270	.902		2.517	.015
1	K of Child	.155	.190	.147	.819	.417
	Attitude of Child	.411	.187	.394	2.197	.033*

^aDependent Variable: Practice of Child

Relationship of Parents' KAP with Children's KAP

There is a weak positive relationship between parents' and children's KAP ($r=.357, n.s.$) (Table 10). The relationships, however, were not significant.

Table 10. *Correlation of Parents' KAP and Children's KAP*

Children	Parents			
	Knowledge	Attitude	Practice	KAP
Knowledge	0.221	0.003	0.224	0.270
Attitude	0.190	-0.033	0.224	0.268
Practice	0.232	0.012	0.320	0.366
KAP	0.253	-0.007	0.309	0.357

$p < .05$

Discussion

Parents' KAP on Waste Segregation

Majority of the parents had high KAP scores. This implies that parents have adequate knowledge on waste segregation, a positive attitude towards waste segregation, and practice waste segregation at home. Grodzinska-Jurczak et al. (2006) also found that parents occasionally showed positive environmental attitudes and majority of parents of preschoolers in their study separated their wastes into appropriate waste bins often/very often. Recently, Badrum and Mapa (2020) revealed that adults in their study had high knowledge, high attitude, and good practice levels on solid waste management.

Their high scores may be expected since at adulthood, cognitive abilities such as memory and logical reasoning are even more developed (Capuzzi & Stauffer, 2016). In addition, educational attainment is high for majority of the parents. Grodzinska-Jurczak et al. (2006) found that parents with higher educational attainment showed more pro-environment attitudes. Badrum and Mapa (2020) attributed the favorable attitude of adults in their study to personal experiences and observations on the environment. Further, there are SWM information materials aired or posted on different media and their exposure to these may have added to their knowledge. This area warrants further study.

Parental mean scores were high for attitude and knowledge and lowest on practice. Buil et al. (2019) found that majority of the parents of preschoolers had knowledge for recycling

aluminum packaging. Grodzinska-Jurczak et al. (2006) reported that the parents of preschoolers had favorable environmental attitudes but were not as willing to change their old habits and engage in more pro-environmental practices. It can happen that knowledge and attitudes do not become practices due to a possible reluctance to give up a comfortable lifestyle for the sake of the environment or there may be a lack of available mechanisms in the community to motivate SWM practices. Banga (2011) found that more than half (60%) of the respondents did not support SWM practices because they thought that it is “time wasting and a dirty job” and should only be done at collection points or at landfills. In Metro Manila households, those who did not practice SWM pointed to the following reasons: these are troublesome chores they did not have time for; segregation is meaningless if all wastes are dumped into one truck at collection time; lack of storage place of waste before collection time; and penalty is not given to those who do not practice it (Bennagen et al., 2002; Sumayao & de Guzman, 2007). Thus, intensive information and education campaigns through various media platforms are needed to continuously inform and motivate families to action.

Children's KAP on Waste Segregation

Less than half of the children had high KAP scores. This implies that the children have average-high knowledge on waste segregation, a positive attitude towards waste segregation, and practice some waste segregation at home. According to Arora and Agarwal (2011), there are only a few studies on children's KAP, and these showed that environmental knowledge is quite low. Mahat et al. (2019), for one, found that preschoolers' knowledge on recyclable and non-recyclable materials was low. Arora and Agarwal (2011) stated too that more studies focused on school-aged children, however, and not preschoolers, thus, pointing out the need to do further studies on children in the formative years.

To engage in waste segregation, children must have some basic mathematical knowledge in sorting. Sorting enhances children's skills in categorizing objects and identifying similarities and differences in shape, color, size, and other dimensions. Between four to six years, children can sort based on one or two dimensions such as shape or color (Smith et al., 2017). In their literature review, Kahrman-Öztürk et al. (2012), reported that preschool children can learn about environmental and sustainability concepts through a project

approach which highlights concrete and experiential activities. Further, Borg (2017) found that preschoolers have knowledge about sorting different recyclable items. Thus, children have the basic competence for sorting and this can be further enhanced with developmentally appropriate activities.

Children's mean attitude score is slightly higher than their scores in knowledge and practice. On the contrary, Grodzinska-Jurczak et al. (2006) reported that many preschoolers in their study did not have a positive attitude toward waste segregation and they attributed this to a low level of knowledge and practices on waste management. Cherry (2020) reported three factors which could influence attitude formation: experiences, social factors, and learning. The child may have experiences and observations about SWM from home, the school, and the media. They may have been taught that caring for the environment is a task that humans should perform and that children can assist through waste sorting and segregation, proper waste disposal or other actions they are capable of. Also, they may have been rewarded or reprimanded in relation to SWM practices. Parental modeling, expectations, and attitudes are influential to child attitude formation as these are internalized over time (National Academies of Sciences, Engineering, and Medicine, 2016). As Bandura (1977) emphasized, children imitate the persons significant to them and this may include these people's attitudes. With frequent family interactions comes the opportunity to learn and imitate the attitudes of significant adults on various constructs, including caring for the environment.

The children's KAP total mean score is in the mid-range which shows that they have an average KAP on waste segregation. Based on the standard deviation, while some children's scores are in the high range, some children scored very low. This shows that children must improve on all domains for better SWM. The early childhood stage is an appropriate time to start developing environmental awareness, attitudes, and habits (Gulay, 2011; Mahat et al., 2019). Children are naturally curious and learn in the context of supportive relationships, thus, environmental education at home and at school must be implemented.

Relationship Between Children's KAP and Age and Sex

There is a very weak positive correlation between children's KAP and their age and sex.

This implies that age and sex are only slightly associated with children's KAP. Still, the positive relationship connotes that as children grow older, their KAP becomes higher, albeit slightly. This may be due to better cognitive capacities as they grow (Berk, 2015). Their attention capacities increase in relation to task demands, helping them to remember. Also, they become aware of mental states such as beliefs, intentions, and attitudes which can influence one's actions (Berk, 2015). With these, children may better understand waste management concepts and processes such as recycling and composting along with the purpose of waste segregation.

There is a very weak positive correlation between children's KAP and sex. The girls tend to have a slightly higher KAP than boys. This implies that they have higher knowledge on waste segregation, a more positive attitude, and practice waste segregation more than boys. With young children, girls tend to be more compliant than boys in terms of obeying rules and authority figures (Berk, 2015; Granie, 2007). This is in part due to gender socialization practices at home and in other social contexts. However, Kahrman-Öztürk et al. (2012) found that gender does not influence ideas on preschoolers' sustainable development while Kesicioğlu and Alisinaoğlu (2009) found that boys had more positive attitudes toward environmental issues. Gender differences on KAP related to environmental concepts warrant further investigation.

Contribution of Parents' Knowledge-Attitude to their Practice

Parental knowledge is a predictor of their practice. Parents are likely to practice waste segregation so long as they have adequate knowledge about it.

There have been studies that have also seen the impact of knowledge on behaviors. In an earlier study, Heslop et al. (1981) found that there is a strong positive relationship between knowledge and attitude towards environmental protection and conservation and that knowledge is slightly more influential than attitude on their practice. Further, Mrema (2008) stated that people who are environmentally aware are more likely to engage in environmentally acceptable behavior than those who do not have this knowledge. Tatlonghari and Jamias (2010) found that adults with higher knowledge scores were more likely to practice SWM.

Badrum and Mapa (2020, p. 148) said that the relationship between these three are “dynamic and reciprocal.” Knowledge gains may influence one’s attitude which may also influence behavior. Attitudes may also influence one’s knowledge search which may also influence behavior. Waste segregation programs intended for parents should provide facts that will enrich their knowledge to increase the likelihood of sustained waste segregation practices at home.

Contribution of Children’s KA to P

Children’s attitude is a predictor of their practice, meaning that children’s attitude is more influential than knowledge on their practice.

Similarly, Chu et al. (2007) presented that the correlation between children’s attitude and behavior was stronger than for knowledge and behavior. Alici (2013) also found that children’s pro-environmental behaviors were influenced by their environmental knowledge and attitude. As stated earlier, Badrum and Mapa (2020) pointed to the reciprocal associations between knowledge, attitudes, and behavior. There are factors that may influence children’s attitudes to the environment such as significant people (i.e., parents, teachers, peers) and their support of and proximity with the children (Kesicioğlu & Alisinaoğlu, 2009). Situational factors were also pointed out by Alici (2013) as a factor which may influence knowledge, attitude, and behavior positively or negatively such as economic status, social pressures, opportunities, and barriers.

Waste segregation programs intended for preschoolers should target the enhancement of their attitudes through strategies which are developmentally appropriate for them. Studies which have shown increases in KAP in children have made use of interventions which included creative drama, storytelling, games and play activities, projects, visiting animal shelters and farms, and other experiences in the natural setting (Alici, 2013; Haktanir et al., 2011; Kahriman-Öztürk et al., 2012; Lewis et al., 2010; Prince, 2010). Interventions could be short as two weeks (Prince, 2010) but could last for 6 weeks to allow for habit formation (Alici, 2013).

Children learn concepts from their environment when all their five senses are engaged in exploration (Ponticorvo et al., 2019). Sankoh and Yan (2013) found in their study that their

respondents aged 10 and below could be part of household waste disposal tasks. Segregating and carrying the wastes to its proper disposal bins made concrete what is sanitary waste disposal and the reasons why it is important to do. Preschoolers should have opportunities to be connected to the natural world and the realities of their real-life local contexts, interact with the environment through playful discovery, and feel a sense of oneness to it. The likelihood of fostering connectedness to their world may arouse in them the desire to keep the environment alive, clean, and appealing. They might manifest a greater willingness to follow rules and practice environmental behaviors that would preserve the world.

Relationship of Parents' KAP with Children's KAP

There is a weak positive relationship between parents' and children's KAP (Table 10). A crucial function of the family is education which equates to the socialization of children (Haralambos & Holborn, 2008). The family is considered as the primary agent of socialization through which children learn language, and acquire values, beliefs, and skills (Anastasiu, 2012). Parents, considered as the child's first teachers, forge a secure attachment bond, through which they can influence the child's development, learning, and transfer of values (The Urban Child Institute, 2011). Everyday interactions between child and significant family members serve as the child's basis for learning all these. Before the child reaches preschool, the family has aided in establishing the child's behavior.

Previous studies have highlighted the influence of parents' knowledge, beliefs, and behaviors on their children's eventual environmental knowledge, attitudes, and behaviors (Borg, 2017; Evans et al., 2007; Grodzinska-Jurczak et al., 2006). Kesicioğlu and Alisinanoğlu (2009) stated that children share similar environmental attitudes with their parents and significant others due to their proximity and/or close interactions and adult support given. These experiences can also heighten the child's environmental awareness. Further, Grodzinska-Jurczak et al. (2006) and Yorifuji (2003) pointed to children's environmental cognition, attitudes and behavior being shaped by significant others when children make these significant people as their behavioral models related to environmental care.

It is notable that the correlation of parents' practice to children's practice is higher than the

other correlates. It appears that as parents practice waste segregation, the children observe them and later, imitate their behaviors since they are significant models. Yorifuji (2003) found that when parents engage in conversations about the environment and even praise children for pro-environment behaviors, there are even slight effects on the child's behaviors, but the strongest effect was brought about by children's observations of parental pro-environment behaviors. This further emphasizes the importance of observation, imitation, and modeling in learning as Bandura (1977) presented. With the support of a more knowledgeable other, like the parents, a child's ability to engage in pro-environmental behaviors increases if interactions are appropriate for the child's skill level. Parents can initiate nature trips and activities at home which can enhance children's KAP.

The correlation of parental and children's attitude is very weak and negligible. This also cancels out its negative relationship. While parents may verbally express their attitudes, children are more responsive and influenced by what parents practice and model. Furthermore, parental attitudes may not be fully grasped yet by the children as it is something abstract; preschool children learn through concrete objects and experiences (Gulay, 2011).

It should also be emphasized that parental KAP can be positively influenced by children's KAP. Grodzinska et al. (2003 as cited by Mrema, 2008) found that through intergenerational influence, parents' environmental knowledge can be improved through their children's environmental knowledge. Borg (2017) found a positive relationship between children's understanding and self-reported practices of sustainability issues and the involvement of caregivers in sustainability discussions and activities initiated at school. Parent-child interactions pave the way for the bi-directional influences of the parties to each other. The influential power of environmental education programs for children, also known as education for sustainable development (ESD), cannot be discounted and should be promoted (Alici, 2013; Buil et al., 2019; Borg, 2017; Gulay, 2011). Although environmental programs, being often school-based, are addressed to students, these programs can also influence the knowledge, attitude and behavior of adults including parents, teachers and other community members (The Urban Child Institute, 2011). Children also have the power to influence people around them and can be agents of change for environmental sustainability (Buil et al., 2019). This bi-directional impact merits further study.

Conclusion and Recommendations

This study contributes to the knowledge on parents' and children's KAP on waste segregation and their relationship. Generally, parents show high knowledge, positive attitude, and high practice levels while more children showed mid-level to high levels of knowledge, attitude, and practices. Children's KAP increased slightly with age and girls tend to have a slightly higher KAP than boys. Parents' knowledge predicts their practice while children's attitude predict their practice. Results also indicate that parents' and children's KAP are weakly related. The findings can be essential in increasing and improving information and education initiatives of current SWM programs towards parents or households.

The scope of this study is limited to the 4–5-year-old children enrolled at the preschool laboratory and their parents. It also focused only on the perceptions and actions of the parents and their children on only one environmental topic: waste segregation. Future studies can consider other environmental issues to expand the knowledge base.

Future research can investigate the relationship of family demographics (e.g., parental age and educational attainment, family size) with parents' KAP and children's KAP on waste segregation with a larger sample to secure the generalizability of results. Conducting a quasi-experimental study with an intervention component on waste segregation for preschoolers and their parents over a time can also be considered. A comparative study on children's waste segregation at home and at school can be done to consider external influences.

It is recommended that parents facilitate their child's environmental education at home through interesting storytelling, art, music, and nature activities. Additionally, it is necessary that parents commit to practicing waste segregation at home, consistent with practices at school. Thus, partnership with the school can be beneficial for pro-environment habit formation of children. The preschool can initiate an environmental education for children with parental involvement so children can internalize their role as environmental ambassadors.

Children are the future stewards, and they will hold the power to make environmental decisions as adults to protect or exploit our environment (Chawla, 2007). At a young age, children should receive adequate environmental education because their attitudes and behaviors can become fixed by the time they enter high school (Van Niekerk, 2014; Williams,

2011). They must be taught so they can lessen or reverse the impacts of current environmental problems in the future with adequate knowledge and skills (Williams, 2011). Children can be instrumental as environmental advocates and change agents in their families and societies if significant adults can help them develop a loving and protective stance to the environment. As Dr. Sallie McFague (1997) wrote, “We will not save what we do not love, and we cannot love what we do not know.”

Compliance with Ethical Standards:

Ethical approval: All procedures for this study were in accordance with the ethical standards of our institution.

Informed consent: Informed consent was obtained from all individual participants (parents) included in the study.

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Appendix

Sample Knowledge Item in Pictorial Interview Schedule



A1. Wastes are things that are unwanted and useless.
Ang basura ay mga bagay na hindi na natin kailangan o magagamit.

TRUE	FALSE
Tama	Mali

Sample Attitude Item in Pictorial Interview Schedule



B2. I should keep/reuse some solid waste.
Dapat akong magtaga/muling gumamit ng ilang basura.

AGREE	DISAGREE
Okey	Di-okey

Do Children Do as Parents Do?:
Parents' and Pre-School Children's Knowledge, Attitudes and Practices on Waste Segregation

Sample Practice Item in Pictorial Interview Schedule

