



林思齊東西學術交流研究所  
David C. Lam Institute for East-West Studies (LEWI)

**Working Paper Series** 研究報告系列

Paper Number: 115  
September 2011

Information Sources, Perceptions, and Attitudes as Predictor and  
Mediator of Behavioral Inclination: A Study of School Students  
Social Learning about Persons with a Disability

Ling Chen , Guangchao Feng and Vivienne Shuet Yan Leung  
Hong Kong Baptist University

CHEN Ling's areas of interests include Intercultural Communication, Organizational Communication, Communication Competence, Language and Social Interaction, and Chinese Communication. She has published some 50 articles and 1 book so far. Her research works have appeared in journals such as *International Journal of Intercultural Relations*, *Research on Language and Social Interaction*, *Human Communication Research*, *Communication Monograph*, *Communication Research*, etc. Chen is currently an Associate Editor of both *Management Communication Quarterly* and *Communication Theory*, and the immediate past Chair of Intercultural Communication Division of ICA. Current and past editorial board services include a number of international journals, *Human Communication Research*, *Journal of Communication*, *Howard Journal of Communications*, *Management Communication Quarterly*, *Communication Studies*, *Journal of Applied Communication Research*, *Discourse and Communication*, *Journal of Social and Personal Relationships*, and *Chinese Journal of Communication*.

The authors welcome comments from readers.

Contact details:

**E-mail:** [chling@hkbu.edu.hk](mailto:chling@hkbu.edu.hk)

**David C. Lam Institute for East-West Studies (LEWI)  
Hong Kong Baptist University (HKBU)**

*LEWI Working Paper Series* is an endeavour of David C. Lam Institute for East-West Studies (LEWI), a consortium with 28 member universities, to foster dialogue among scholars in the field of East-West studies. Globalisation has multiplied and accelerated inter-cultural, inter-ethnic, and inter-religious encounters, intentionally or not. In a world where time and place are increasingly compressed and interaction between East and West grows in density, numbers, and spread, East-West studies has gained a renewed mandate. LEWI's Working Paper Series provides a forum for the speedy and informal exchange of ideas, as scholars and academic institutions attempt to grapple with issues of an inter-cultural and global nature.

*Circulation* of this series is free of charge. Comments should be addressed directly to authors. Abstracts of papers can be downloaded from the LEWI web page at <http://www.hkbu.edu.hk/~lewi/publications.html>.

*Manuscript Submission:* Scholars in East-West studies at member universities who are interested in submitting a paper for publication should send an article manuscript, preferably in a Word file via e-mail, as well as a submission form (available online) to the Series Secretary at the address below. The preferred type is Times New Roman, not less than 11 point. The Editorial Committee will review all submissions. The Institute reserves the right not to publish particular manuscripts submitted. Authors should hear from the Series Secretary about the review results normally within one month after submission.

*Copyright:* Unless otherwise stated, copyright remains with the author. Please do not cite or circulate the paper without the author's consent.

*Editors:* Si-ming LI, Director of LEWI; Cindy CHU, Associate Director of LEWI.

*Disclaimer:* David C. Lam Institute for East-West Studies (LEWI), and its officers, representatives, and staff, expressly disclaim any and all responsibility and liability for the opinions expressed, or for any error or omission present, in any of the papers within the Working Paper Series. All opinions, errors, omissions and such are solely the responsibility of the author. Authors must conform to international standards concerning the use of non-published and published materials, citations, and bibliography, and are solely responsible for any such errors.

*Further Information* about the working paper series can be obtained from the **Series Secretary:**

David C. Lam Institute for East-West Studies (LEWI)  
Hong Kong Baptist University  
Kowloon Tong  
Hong Kong  
Tel: (852) 3411-7273; Fax: (852) 3411-5128  
E-mail: [lewi@hkbu.edu.hk](mailto:lewi@hkbu.edu.hk)  
Website: <http://www.hkbu.edu.hk/~lewi/>

**Information Sources, Perceptions, and Attitudes as Predictor and Mediator of Behavioral Inclination: A Study of School Students Social Learning about Persons with a Disability**

Ling Chen<sup>1</sup>, Guangchao Feng and Vivienne Shuet Yan Leung  
Hong Kong Baptist University

**Abstract**

This study is a secondary analysis of survey data of primary and secondary school students (N = 2,865) in Hong Kong. Guided by Social Cognitive Theory, path models of social learning about persons with a disability (PWDs) were tested connecting exposure to information from different sources and contents of information with perceptions of, attitude, and behavior inclination toward PWDs. The best-fit model showed contents as better predictors of perceptions and attitudes than exposure to information from either media channels or interpersonal sources. Exposure to interpersonal sources was better predictor than that to media channels. The effects of content and exposure were also mediated by perceptions of PWD capabilities, of PWD inner state, and general attitude toward PWD

Keywords: Socialization, Exposure to Information, Interpersonal Sources, Media Channels, Content Type, Perceptions and Attitudes, Persons with a Disability

Media effects on child development have long attracted scholarly attention and left few stones unturned. Meanwhile the extant literature is uneven in coverage; certain topics are sparsely visited in cognition development associated with social categorization of groups. For example, socialization about persons with disability (PWDs) is barely present in media effects research overviews over the years (e.g., Perse, 2001; Van Evra, 2004) for lack of research. Relevance of media theories to this topic is insufficiently examined and its potential contribution to our understanding of communication in general largely untapped. Besides, other information sources in socialization are rarely investigated along side media effects, leaving something to be desired in our knowledge of communication and socialization.

---

<sup>1</sup> Author note : The original survey project was supported by a faculty research grant from Hong Kong Baptist University to the first author. The authors wish to express great appreciation to the 135 schools for their support and assistance in this project. A list of the participating schools is available from the first author. Thanks also go to Kaman Lee for assistance in questionnaire development, Ivy Hang, Sylvia Chan, and Raymond Wong for their help in data collection and data preparation.

To help fill the gaps, this study examines the connection between exposure to information about PWDs from different sources in communication and perceptions of as well as attitudes toward them among primary and secondary school students. Working with the social cognitive theory of communication as a theoretical framework and informed by the literature on communication and socialization about social groups, we conducted a secondary analysis of the data from a large scale survey of Hong Kong students' attitudes towards PWDs. The study aims to ascertain the relationships between behavior inclination towards PWDs and perceptual as well as attitudinal factors and to test effects of exposures to and retention of relevant information via both media and other communication sources.

### **Communication and Socialization**

**Media's socialization role.** Socialization is about acquisition of knowledge needed to be a functioning member of society, a crucial developmental process of the young. Socialization and related learning of norms and values of a society is a basic communication function, and mass media in contemporary societies are a major information source, through which children learn about, among other things, people including societal perceptions of and attitudes toward various peoples and social groups. Research has amply documented stereotyping of social groups such as gender, race, national identity, and age, in a wide array of media contents (see Seiter, 1993; Calvert & Wilson, 2008 for overviews) and, to a lesser extent, evidenced media's influence on social perceptions in this regard. One expects (e.g., Dixon, 2008) children to be more susceptible to racialized, or stereotypical, beliefs due to their media consumption and youth. There are reports that exposure to media portrayals increases children's tendencies to agree with sex-role stereotypes as depicted (reviewed in Signorielli, 2001) or, in case of positive media images, affects their choice of playmates from other ethnic groups than their own (e.g., Greenberg & Mastro, 2008). Children are also found to selectively interpret media messages as relevant to their life world and peer-cultures (e.g., Fingerson, 1999; Hadley & Nenga, 2004).

All things considered, mass media are generally recognized as a base of social understanding and knowledge internalization, whereby to a large extent people benchmark their thoughts, opinions and behaviors and children learn to form their views of society and social groups. Although the extent of media's actual developmental impact has not been fully or comprehensively studied, there is evidence that the association between exposure to violent

media content and children's aggressive behaviors is considerable as to rival that between smoking and lung cancer in the general population (Strasburger, 2004). Media impact on socialization about social groups may work the same way as effects on children's behaviors.

**Other socialization agents.** Although a common socialization agent, media are not the only or the predominant source of social information for children. Direct experiences, from personal contact, and indirect experiences, obtained through interpersonal communication with significant others at home and in school as well as media consumption, constitute the socialization environment for children and help shape their attitude formation toward various social groups (O'Keefe & Reid-Nash, 1987). Communication between the social referent others and a child about social norms and norms construal highlights the crucial role of referent others as socialization agents, such as parents, teachers, and peers, to whom children connect with emotional ties at a young age. That the strength of relational connection evokes such social learning finds illustration in a study of communication about norms in South Africa (Boer and Westhoff, 2006). In relationships with more or less important referents (strong or weak ties), the study found that communication with strong ties affected perceptions of subjective norms about safer sex among adolescents as they tended to learn from strong social ties.

Information from other than media sources is also crucial in shaping children's knowledge about social groups (e.g., Balter & Tamis-LeMonda, 2003) and their social behaviors toward the latter, particularly in the absence or rarity of direct experience. Parents as a primary agent of gender role socialization are universally recognized, although infrequently examined along side the media's role for the same. Based on the extant empirical studies on the mechanisms through which parents conduct racial and ethnic socialization, Hughes, Rodriguez, Smith, Johnson, Stevenson & Spicer (2006) reiterated the role of parents as a primary socialization agent in learning about such social groups, about dealing with other groups than one's own, about attitudes toward social diversity and related values such as egalitarianism.

### **Communication and Socialization about PWDs**

Available research about media's socialization role has been attending to gender, race, and ethnicity, and little on other, underrepresented groups such as the poor, the elderly or the disable. It is not altogether clear as to the process of learning about each of them is empirically the same for all, e.g., if learning about gender or ethnicity is the same as learning about disability. Aside

from the categorical difference, there is the matter of visibility, social and literal, that is markedly different from group to group, which could affect learning about them. PWD is unique among social groups. Unlike those based on gender, race/ethnicity and age, which are basic descriptive of a person, physical disability is defined by the absence of characteristics universally taken for granted as normal (World Health Organization, 1980) and relatively uncommon. Gender socialization attends to learning of one's own gender in contrast to the others who are different. Racial/ethnic socialization attends to learning of one's own, often non-dominant, race/ethnicity in contrast to other ethnic groups (e.g., Hughes, et al., 2006). Socialization about PWDs in most cases focuses on social learning of another group that is invisible thus easily neglected. Learning about PWDs appears to be less of a necessity and less prominent<sup>1</sup> than learning about gender, race, etc., except for the disabled child where oneself is involved. Study of socialization about PWDs thus may provide insight to salience of communication to socialization about groups, not available in other learning.

PWDs, being invisible, have long been associated with social stigma (e.g., Goffman, 1963). In the mainstream media including films and advertising, PWDs are generally absent (e.g., Hardin et. al., 2001). When present, PWDs are often portrayed stereotypically, e.g., as burdens on family and friends, being ignored by others. Although positive images of disabled people have gradually increased in recent decades, the change is much slower in Asian societies, the context of our study. Even in award-winning Hong Kong dramas and films, e.g., “The legend of Ah Wong” and “Why me”, characters with impairments are shown to encounter social barriers in study, work, romance and other aspects of social life. Such regularly negative media depiction may be a reason that perceptions and norms about PWDs remain stagnant and slow to change. Social norms, beliefs about what people commonly do and should do in a situation, have been shown a powerful influence on a variety of behaviors (e.g., Cialdini, Reno, & Kallgren, 1990), which would include conducts toward rather invisible PWDs.

**The social cognitive theory.** Whereas few studies are available on socialization about PWDs, the social cognitive theory (Bandura, 1986), originally social learning theory, has delineated the processes of attitude learning and formation. It proffers that, via the function of attention, retention, motor reproduction and motivation, personal, environmental and behavioral factors interact to influence perceptions and attitudes of the individual, which may well be applicable to learning about PWDs.

The theory suggests that modeling is one most pervasive means to transmit values, attitudes and behavior, by which people learn and receive reinforcement from live or symbolic models, including the result of the model's behavior. Models exemplify appropriate activities, and people learn from observing their performances, based on their understanding of things happening around a model and see whether the conducts would result in rewards or punishments. Common images from mass media tend to be observed as the social norm and models of attaining social acceptance from peers. The latter is crucial to one's personal maturation, especially for children/teenagers.

The imagery from the media may lead to certain forms of understanding or interpretation of the social reality, positive and encouraging or distorted, stereotyped and biased. As noted above, media's role as sources of vicarious experience about social groups is considered major in creation of related cognition (stereotypes), development of negative attitudes (prejudice), and performance of exclusionary behaviors (discrimination) (Graves 1999) and may influence children through examples of prejudiced or fair-minded people along with diverse social groups that stimulate positive or negative affect. Media image may positively alter negative stereotypes about PWDs children encounter and change those for the better (e.g., Monson and Shurtleff, 1979). Cohen (1994) suggests that children are not only aware of the disabled images in media but also the way they are shown to fit into a social environment: they learn social interaction appropriateness through modeled behavior and learn preference for a non-disabled person over people with disability in social interactions. Thus, children internalize and reproduce the symbolic representations of the behavior toward PWDs and are likely motivated to interact with PWDs when they believe that doing so are socially acceptable (self-reinforcement), an intrinsic gratification for future continued interaction with PWDs.

Children as natural "social learners" also learn from live models, people in their immediate environments such as parents at home and other adults in their life, as well as those seen in the media. While family is the primary agent where a child learns basic values and social roles, children in transition from late childhood to adolescence may be also influenced by peers as they seek to redefine their identity from peers' recognition and acceptance. Social learning may cultivate negative attitudes, due the general societal bias against disability conveyed through social discourse interpersonally (Casling, 1993), or lead to varied attitudes in students, due to shifts in societal attitudes as in the case of gender (Dreyer, Woods, & Sherman, 1981).

## **Rationale and Research Questions**

To date, empirical works are limited on the role of communication in socialization and learning about social groups, via media and interaction with referent others. Little is available about the actual operation of main factors, such as exposure to information about PWD from various sources and contents of such information, in learning and formation of related perceptions and attitudes, not to say related behaviors. The discussion above presents the theoretical ground for the present study to reexamine data from an earlier survey of school students in Hong Kong as a step to gain new insight as well as empirical evidence.

Based on the social cognitive theory's conceptualization of symbolic modeling, effect of information content and communication sources in media consumption and interpersonal communication on perceptions and attitudes were hypothesized, in terms of retention of information contents about PWDs from exposure to media channels and interpersonal sources.

H1. Exposure to information about PWDs from media channels will affect students' perceptions of and attitudes toward PWDs.

H2. Exposure to information about PWDs from important interpersonal sources will affect students' perceptions of and attitudes toward PWDs.

H3. Contents about PWDs will affect students' perceptions of and attitudes toward PWDs.

A research question arisen about specific effects of different contents about PWDs on related perceptions and attitudes.

RQ1. How do contents about PWDs affect perceptions of and attitudes toward them?

Given the contemporary social concern over equal opportunities (EO) leading to civic education, a related interest is prosocial effects of exposures to EO education information about PWDs on perceptions and attitudes (Mares & Woodard, 2001). A question is posed.

RQ2. Does exposure to education information about PWDs affects perceptions of and attitudes toward them?

The social cognitive theory suggests that the association between communication and behavior is not direct. Rather, communication events influence behavior via related perceptions and attitudes. Research question 3 is about this connection, following a hypothesized link to possible behavior from perceptions as well as attitudes.

H4. Perceptions of and attitudes toward PWDs will influence possible behaviors toward them.

RQ3. How do perceptions of and attitudes toward PWDs mediate effects of exposure to information about PWDs on possible behavior?

## **METHOD**

### **Respondents**

Data were from a 2001 baseline survey of Hong Kong primary and middle school students, response-rate > 80%, that produced a disproportionate stratified sample of students from four school levels (primary 4, secondary form 1, form 4, and form 6) in 135 schools and represented all residential districts<sup>2</sup>. To further improve data quality, fifty percent of the original data was randomly selected for the current study, N = 2,865, representing 126 schools. The sex ratio of the current sample was about even, 51.9% females and 47.9 % males, all Chinese. Average age was 13.34, SD = 3.549, ranging from 10 to 17. The school level distribution was about equal, from 24% to 26%. Family backgrounds showed a wide range.

### **Measurements**

Besides demographics (age, sex, family backgrounds, and school level), measures in the survey included prior contact with PWDs, exposure to general information about PWD, contents exposed to, PWD education exposure, PWD education information sources, perceptions of and attitudes towards PWDs including inclinations of approach (e.g., non-discrimination, interaction, and willingness to assist) and avoidance (e.g., discomfort, fear, and keeping distance).

PWD information exposure was operationally defined as recalled exposure to media channel and interpersonal source respectively, as well as relevant content. The variable of interpersonal information source included 3 types of significant others (parents, teachers, peers), assessed with simple count of positive responses. The media information channel was likewise measured with responses to 7 media channels (film, TV, book, magazine, radio, newspapers, etc.). PWD education exposure was assessed with 2 binary items respectively for in and outside of school. PWD educational material source was measured with up to 16 forms (leaflet, pamphlet, posters, radio, event, exhibit, public service commercials, etc.). Lastly, contact was

assessed with 4 binary items including acquaintance (have seen, often see; and know, know well). Count of affirmed items (*yes* = 1, *no* = 0) was averaged for each of the variables.

Information content included three common depictions about PWDs recalled of both media and interpersonal sources, assessed as above by counts of positive response to *yes* or *no* questions (*yes* = 1, *no* = 0). Pity content referred to PWD portrayed as being pitiful, unfortunate, and needy (12 items). Scary content was that of PWDs being frightening, disgusting (8 items). Assisting content was that suggesting assistance one should extend (4 items). The content measures were all averaged for easy comparison.

**Perceptions and attitudes questionnaire.** Thirty-five items about attitudes toward and perception of PWDs were selected from existing instruments (e.g., Antonak, & Livneh, 1988) responded on a 4-point scale (from 1- *completely disagree* to 4 – *completely agree*). These included main perception aspects about PWDs: PWD capabilities (4 items), PWD intelligence (1 item), PWD self-perception (2 item), and general perceptions about PWD (7 items) as well as beliefs of equality applicable to PWDs (3 items). Attitudes towards PWDs included approach (11 items, e.g., acceptance, no discrimination, intent of interaction, and willingness to assist) and avoidance (7 items, e.g., discomfort, fear, and keeping distance).

### **Factor Measures**

A factor analysis procedure was performed on attitudes and perceptions items in the current study to reduce data and uncover latent factors for further analysis. As the 35 items are ordinal variables with 4 points, we decided against conventional methods such as principal component analysis that assumed at least the interval level variables (Jöreskog & Moustaki, 2000) so as to avoid associated problems (e.g., Muthén, 1983; Muthen & Kaplan, 1992). In stead, the factor analysis was performed in the software Mplus 5.2, using the WLSM estimation (weighted least square parameter estimates) with polychoric correlations<sup>3</sup>. We expected correlation among attitude and perception factors extracted and employed promax oblique rotation. A four factor structure was selected, based on both the substantive reasoning in consideration of item content and comparison of different factor structures, from one factor to three factors. The comparison was done with a statistics testing for continuous non-normal outcomes, the Satorra-Bentler scaled (mean-adjusted) chi-square (Satorra & Bentler, 2001). The results of Chi-Square

Difference Testing showed that the four factor structure prevailed over other factor structures. The chi-square was significant ( $\chi^2(461) = 4536.988, p < .001$ ), being sensitive to large sample size, whereas other fit indices, RMSEA = .056, RMSR = .031, suggested the factor structural model fitting the data well.

Examination of items revealed that two of the factors were of PWD related perceptions and two were of attitudes. The first factor reflected approach-avoidance attitude and was labeled “behavior inclination” that ranged from avoiding (low) to approaching (high), consisted of nine items (e.g., “I am willing to know them (children who are PWDs)”); “I am willing to take classes together with them”; “I will feel uneasy if a PWD sits beside me on the bus—reverse coding”). The second factor was named “general attitude”, ranging from apathy (low) to sympathy (high), and represented in seven items, implicit or expressed (e.g., “I will give up my seats to PWDs on the bus”; “I feel much sympathy with PWDs”; and “I believe that PWDs can be one of my best friends”). The third factor was named “perceived PWD capabilities”, from less than normal (low) to normal (high) on 11 items, such as “I think PWDs can be very smart”; “I think PWDs cannot perform well at work (reversed) ”; “I think PWDs can be independent”. The fourth factor was labeled “perceived PWD inner state”, ranging from less than normal (low) to normal (high) on eight items. Sample items include, “I figure that PWDs must feel they are helpless”; “I think that most PWDs would rather not socialize with other people”.

The correlations among the four factors were moderate or weak, ranging from .57 to .24 (Table 1). These being correlating factors, we employed factor determinacy (Muthén & Muthén, 2010) to gauge their reliability. The four factor structure returned good factor determinacy, respectively reaching .930, .934, .932 and .912. In addition, alpha coefficients of all four factors were also acceptable ( $\alpha_1 = .836, \alpha_2 = .837, \alpha_3 = .824, \text{ and } \alpha_4 = .735$ ). Factor scores were obtained by averaging the value of contributing items weighted by respective loadings on the factor for use in subsequent analysis.

Table 1

## Factor Correlations

	I. Behavior Inclination	II. General Attitude	III. Perceived PWD Capabilities
II. General Attitude	0.459		
III. Perceived PWD Capabilities	0.519	0.566	
IV. Perceived PWD Inner State	0.493	0.236	0.388

**Structural Path Models**

Informed by the social cognitive theory's conceptualization of communication influence on perceptions, attitudes and behaviors, four path models of two nested pairs were built to identify an effect relationship pattern that best fit the sample. Each model involved one or more potential mediators. All variables were treated as latent constructs. Independent variables included demographics, two PWD information source variables (media channels and interpersonal sources), three information contents about PWDs (being pitiful, scary, deserving assistance), contact with PWDs, exposure to PWD education and PWD educational information sources. General attitude, perceived PWD capabilities, perceived PWD inner state and behavior inclination were mediating and dependent variables.

In the nested model 1 and model 2, all the independent (demographic and communication related) variables predicted perceived PWD capabilities, perceived PWD inner state and general attitude (cognitive), each of which then further predicted behavior inclination, the sole dependent variable closest to behavior. Paths from all foregoing independent variables, except demographics, to behavior inclination were constrained to zero in model 1, with no direct effect of communication, and allowed to vary in model 2, with direct effects together with mediation. These two models were to test the learning mechanism from communication to perceptions, then to general attitudes and lastly to behavior related attitudes.

In the nested model 3 and model 4, all the independent variables predicted both perceived PWD capabilities and perceived PWD inner state, which further predicted general attitude and behavior inclination respectively, while attitude also predicted behavior inclination. Similar to the first pair, paths to behavior inclination from all independent variables but demographics variables were allowed to vary in model 4 and constrained to zero in model 3 for comparison.

These two models were to test the alternative learning mechanisms from communication to attitudes via perceptions, allowing for effects of general attitudes on behavior related attitudes.

To avoid shortcomings of the causal steps approach (Baron and Kenny, 1986) or the multivariate delta method (e.g., MacKinnon, et al., 2002), confidence interval via bootstrapping (bias correction with 1000 resample) was obtained to test observed mediated effects<sup>4</sup>.

## RESULTS

### Descriptive Analysis

**Media channels.** About 1.4% of respondents reported not receiving information about PWDs from any media channels; 97.7% reported between 1-3 and 4-6 channels. The most common media channels were TV and newspaper reported by 85% and 71% respectively.

**Interpersonal sources.** The most common interpersonal source was teachers followed by parents and peers, reported by 50.3%, 36.1% and 30.2% respectively. Thirty-three percent of respondents reported no interpersonal information source; the remaining 67% reported 1 to 3 sources.

**Channels of educational information.** A small majority (59.5%) reported exposure to educational information on PWDs: thirty-six percent reported exposures via channels inside while forty-six percent outside of school. The most reported in-school education channels were education TV programs and brochures, respectively by 21.4 % and 18.4 % of the students. The most mentioned out-side school channel were public service TV commercials (33.3%), public service advertisement (27.5%), posters (27.2%) and brochures (26.2%).

**Contact.** The percentage of respondents with no contact was 12.8%. A small minority (18.3%) reported being personal acquaint of a PWD, e.g., a relative, a friend, or a neighbor, and 8.6% reported knowing a PWD well, while 19.8% had frequent encounter with a PWD.

**Contents of PWD information.** All content included information about PWDs received from significant others and media. Of the three types, the pity content was most reported,  $M = .374$ ,  $SD = .25$ , followed by assistance content,  $M = .363$ ,  $SD = .28$ ; the scary content was least reported,  $M = .047$ ,  $SD = .110$ . For all three types of content, lower grade students generally reported higher exposure than the higher grade counterparts.

**Perception and attitude factors.** The value of the factors was toward the low end, partly due to the weight of factor loadings. The mean of behavioral inclination was .13,  $SD = .30$ , the

lowest in magnitude with the greatest variance. General attitude, the highest of all, had a mean of 1.82, SD = .31. Two remaining factors were similar: perception of PWD capabilities, mean = 1.48, SD = .23, and perception of PWD inner state, mean = 1.46, SD = .28.

### Model Testing

**Model comparison.** Path models were tested using maximum likelihood estimation in the software Mplus 5.2. Log likelihood ratio tests were used for model comparison. Besides the chi-square statistics, model fit was evaluated with common fit indices in addition to model chi-square: Comparative Fit Index (CFI), Tucker Lewis Index (TLI) RMSEA (Root Mean Square Error of Approximation), and SRMR (Standardized Root Mean Square Residual). Results showed that model 4 fit data better than model 3 ( $\chi^2(9) = 68.168$ ,  $p < .001$ ), and model 2 fit better than model 1 ( $\chi^2(8) = 68.168$ ,  $p < .001$ ). Model 4 prevailed and was selected, with the lowest Akaike's Information Criterion (AIC) value (Table 2) in the model comparison.

Table 2  
Model Comparisons

	Log likelihood	df	AIC	Log likelihood ratio test
Model 4	-31868.59	43	63823.18	202.484 <sup>a</sup>
Model 4 with modification	-31767.35	44	63622.70	68.168 <sup>b</sup>
Model 3	-31902.68	35	63875.35	
Model 2	-32375.92	52	64855.83	68.168 <sup>c</sup>
Mode 1	-32410.00	44	64908.00	

Note: <sup>a</sup>between model 4 and model 4 with modification; <sup>b</sup>between model 4 and model 3; <sup>c</sup>between model 2 and model 1

**Model fit.** Although the model fit was generally acceptable,  $\chi^2(15) = 312.822$ ,  $p < .001$ , CFI = 0.921, TLI = 0.738, RMSEA = 0.084, SRMR = 0.038, model 4 further improved after a prediction path was added from perceived PWD ability to perceived PWD inner state as suggested by the modification index. Except TLI, being slightly lower, model fit indexes met the suggested cutoff criteria (Hu & Bentler, 1999),  $\chi^2(14) = 110.337$ ,  $p < .001$ , CFI = 0.975, TLI = 0.909, RMSEA = 0.049, 90% CI = 0.041, 0.058,  $P_{RMSEA \leq .05} = .538^5$ , SRMR = .019. The final

model fit the data very well. R squares indicated that variances explained by independent variables were all significant. Specifically, 52.5% of variance in behavior inclination and 34.2% in general attitude were explained. Perceived PWD capabilities and perceived PWD inner state were relatively poorly explained; respective R squares were below .08.

### **Direct Effects**

The results indicated that information sources from interpersonal channel negatively predicted perceived PWD capabilities ( $\beta = -.018, p < .05$ ) and positively predicted behavior inclination ( $\beta = .017, p = .016$ ), but had no significant effect on perceived PWD inner state. H2 was partially supported. Exposures to information from media channels had a positive effect on behavior inclination ( $\beta = .009, p = .005$ ), a marginally significant effect on perceived inner state ( $\beta = .031, p < .10$ ), but not for perceived PWD capabilities. H1 was partially supported. Overall, exposure to interpersonal sources led to inclination to interact with PWDs and lower perceived PWD capabilities; exposure to media channels had the same effect only on behavior inclination.

Of the three content types, pitiful information content about PWDs negatively predicted perceived PWD inner state,  $\beta = -.445, p = .01$ , had no significant effect on their perceived capabilities and marginal effect on inclination to interact with PWDs ( $\beta = -.064, p < .10$ ). Scary information content about PWD negatively predicted the two perception variables: perceived PWD capabilities ( $\beta = -.433, p < .001$ ) and perceived PWD inner state ( $\beta = -.861, p < .001$ ), and negatively predicted inclination to interact with PWD ( $\beta = -.143, p = .001$ ). Information content about assistance to PWD positively predicted both perceived PWD capabilities ( $\beta = .212, p < .001$ ) and perceived inner state ( $\beta = .465, p < .001$ ), as well as behavior inclination ( $\beta = .07, p = .008$ ). Contact positively predicted perceived PWD capabilities ( $\beta = .055, p < .01$ ) and behavior inclination ( $\beta = .078, p < .001$ ), but had no significant effect on perceived inner state. H3 about the effect of contents about PWDs was partially supported. Results also answered RQ1.

RQ2 asks about effects of exposure to education information about PWDs on perceptions of and attitudes toward them. The results showed neither PWD education exposure nor number of PWD education knowledge sources to have significant effects on any of the three dependent variables. The answer to RQ2 is negative.

H4 was about effects of perceptions of PWDs on attitudes toward them. In the model, the perceived PWD capabilities and inner state each predicted general attitude toward PWDs ( $\beta =$

1.029,  $p < .001$ ;  $\beta = .049$ ,  $p < .001$ ) and inclination to interact with PWDs ( $\beta = .688$ ,  $p < .001$ ;  $\beta = .134$ ,  $p < .001$ ). Lastly, the more positive general attitude towards PWDs was, the greater also was the inclination to approach ( $\beta = .066$ ,  $p < .001$ ). H4 was supported.

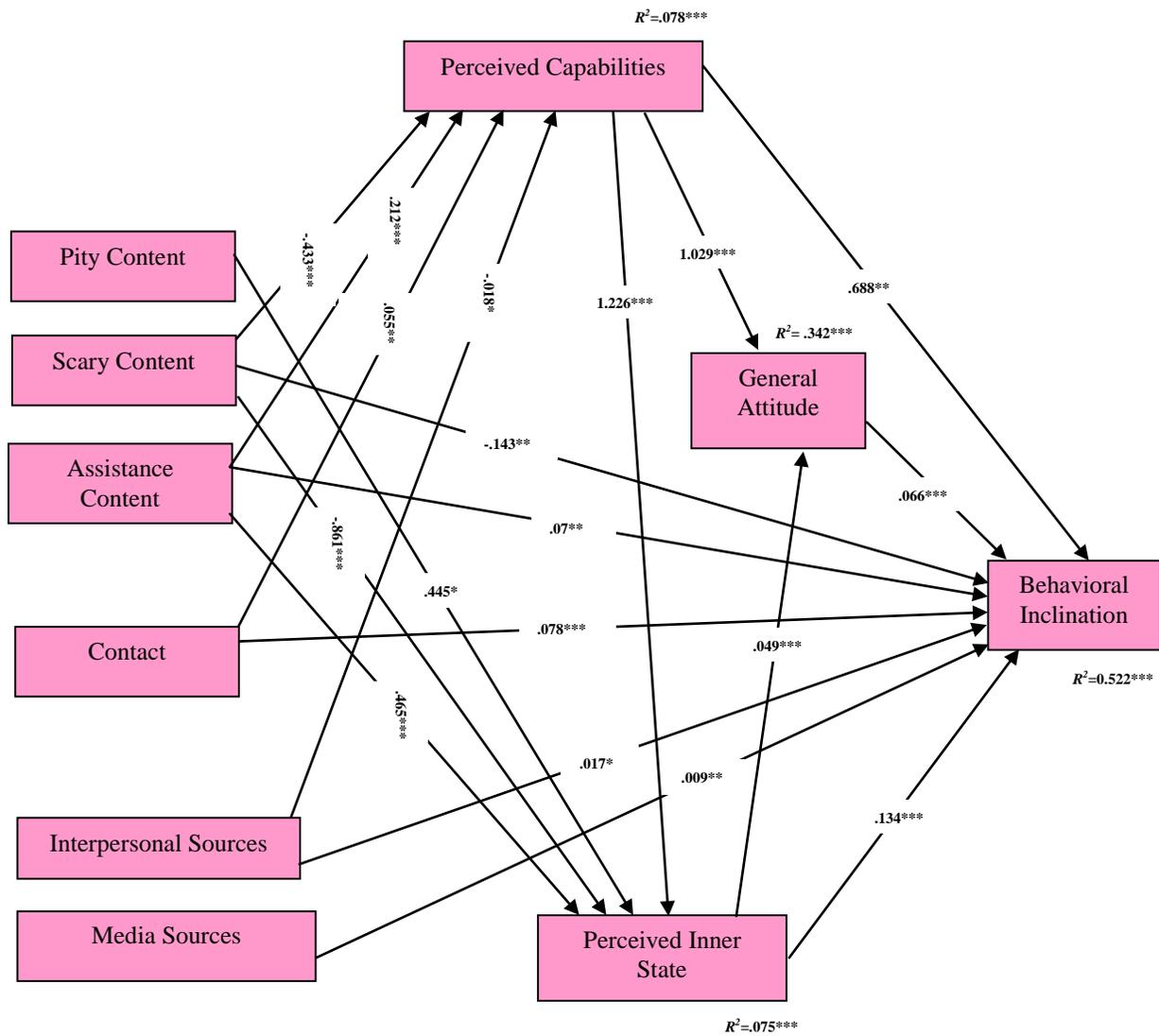
For demographics, female were likely ( $\beta = -.032$ ,  $p = .001$ ) to report higher perceived capabilities, yet no significant between-sex difference for perceived inner state. Respondents at higher school level were likely to report normal perceived PWD capabilities and inner state than their lower level counterparts ( $\beta = .009$ ,  $p = .02$ ;  $\beta = .047$ ,  $p = .006$ ). Age had a negative effect on predicting perceived inner state but not on capabilities, ( $\beta = -.022$ ,  $p = .045$ ).

### Mediation effects

RQ3 asked about mediation of exposure effects, to information about PWDs, on possible behavior. Three potential mediators were in the model (figure 1) affecting behavioral inclination: perceived PWD capabilities, perceived PWD inner state and general attitude. Since this mediation model involved multiple mediators, with correlations among them, unique mediation effects are of interest regardless of overall effects (e.g., Preacher & Hayes, 2008).

The mediation of effects by all three mediators was complementary<sup>6</sup> along with the direct effects of four independent variables on behavioral inclination. Specifically there was mediation of assistance content (indirect effect = .188, CI95% = .142, .253) and contact (indirect effect = .050, CI95% = .019, .084) with positive valence, and mediation of scary content (indirect effect = -0.373, CI95% = -.537, -.265) with negative valence. Pitiful content (indirect effect = -0.058, CI95% = -.123, -.003) had mediating effects only, which was negative.

The model also produced significant indirect effects only on general attitude as the dependent variable via perceived PWD capabilities and perceived PWD inner state as mediators. The mediation effects for prediction from both assistance content (indirect effect = .228, CI95% = .144, .340) and contact (indirect effect = .060, CI95% = .022, .111) were positive, whereas relevant direct effects were not present. That is exposure to assistance content and contact with PWD indirectly and positively contributed to the general attitude toward PWDs. The mediation effects were negative for prediction from both scary content (indirect effect = -0.461, CI95% = -.693, -.279) and interpersonal sources (indirect effect = -0.015, CI95% = -.034, -.002). Thus, exposure to scary content and interpersonal sources also indirectly and negatively contributed to the general attitude. RQ4b was answered affirmatively regarding each of the variables.



**Figure 1.** Path model with perceived PWD capabilities, perceive PWD inner state and general attitude as mediators, presenting statistically significant paths from communication related variables

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

## DISCUSSION

The path model showed direct and indirect effects of information contents, media channels and interpersonal sources, and of perception and attitude variables on the behavioral inclination. Before we interpret and discuss below the findings for better understanding, a caveat should be noted, that the analyses were post hoc with related limitation although the large probability-stratified sample provided assurance of findings being fairly generalizable.

**Information exposure variables as predictors**

Findings, of students' exposure to information of assisting PWDs predicting perceptions of and attitudes toward them in positive ways, suggest that exposure to such content leads to greater inclination to approach PWDs and perceptions of PWDs as having generally normal self-related inner state as well as normal capabilities. This is consistent with the few past studies about positive media portrayal of PWD associating with more positive attitudes in the viewers (e.g., Farnall & Smith, 1999). Information content about assistance to PWDs is considered positive because such content equalizes people on the assumption that anyone may need assistance now and then, contradicting the helpless and pitiful stereotypes. The opposite happens with larger magnitudes for exposure to information evoking fear or pity: exposure to such content leads to less inclination to approach PWDs, perceiving PWDs as having less than normal capabilities and less than normal self-related inner state. Contrary to the conventional thinking, pitiful depictions did not seem helpful in bringing about positive perception and attitudes. Such information with implied sympathetic seems far from sufficient to counter and may even reinforce the stereotype of PWDs as being needy and less than normal. Scary contents appears to be more harmful than assistance content is helpful in positive social learning of PWDs and, similar to and together with pitiful content, contributes more to stereotyped learning and avoidance attitude than can be countered by assistance content alone. In practice, prevention of learning negative perceptions and attitudes of this or any social group may need to focus more on reducing negative portrayal.

Information channels and sources were outdone by contents as a whole, yet still posed noticeable effects. Media channels seem to matter less than interpersonal information source, suggesting the greater role of significant others in students' social learning about PWDs, in spite of media's greater presence in their life. One practical implication of the finding is the need for civic education of the adult population, for one-third of students reporting not having anyone talking to them about PWDs. In relation, interpersonal sources also negatively predicted PWDs perceived capabilities, suggesting the learning of stereotypical information about PWDs from the significant others and also pointing to the need for education of the general public. Greater exposure to information of any sources may have helped create awareness as suggested by the social cognitive theory and seen in the findings, leading to greater inclination to interact with PWDs. This is another finding with practical implication: greater awareness may also help addressing PWDs' social marginalization.

Contact with PWD, which provides first hand knowledge about PWDs, was found to bring about positive perceptions of PWD capabilities as well as greater interaction inclination, in relatively small ways. This study measured contact generally such as having seen and having known PWDs, which are neutral in nature, thus non competitive, and the information learned this way may help in positive attitude formation. This finding provides PWD related evidence in support of the intergroup contact theory (Allport, 1954), which posits that non competitive and voluntary contacts facilitate positive attitudes between groups. More importantly, it brings attention to neutral or non negative information and social learning about PWD for better understanding and positive perception. A social policy implication is for creation of opportunities for contact with PWDs in order to encourage such learning in direct experience.

Surprisingly, PWD education exposure had little effects on any dependent variables in this study. This may be due to its short history and scarcity at the time of survey, as the relevant local law was barely 4-year old and the information not yet widely disseminated – barely half of students reported any exposure to information from PWD related civic education. This is an aspect in need of further investigation and update. On the other hand, findings of the direct effects of all communication related variables, simultaneously present along with mediated effects highlighted the role of communication in social learning about PWDs.

### **Perceptions and general attitude**

The findings that perceptions of PWD capabilities had the largest effects in the model, predicting the perceived inner state and general attitudes as well as behavioral inclinations, suggests the importance of this variable in communicating and learning about PWDs. This perception was more substantial than perceived PWD inner state or general attitude toward PWDs in predicting and mediating the effect on the behavioral inclination. Perceived PWD capabilities also directly affected perceived PWD inner state, which may have to do with the social norm of associating the individual's self-concept with their capabilities so greater or lesser capabilities correspond with positive or less positive self concept. It is likely that this norm had also been conveyed in socialization, an aspect for future investigation. The results showed that students' general attitude and perceptions of PWD capabilities as well as that of PWD inner-state were toward the positive side, but their behavioral inclination tended to be low in comparison, pointing to a need for future studies to identify other explanations than those investigated in this

study and to address the challenge of PWD related civic education for their integration into the mainstream.

The correspondence between perceptions of PWD capabilities and general attitude is consistent with the cognitive consistence theory (Festinger, 1957) and directs attention to their mediating role in socialization. The findings, that perceptions of PWD inner state mediated effects on general attitude from assistance content and contact and that perceptions of PWD capabilities mediated effects on general attitude from scary content and interpersonal sources, provide evidence on the relationship between perceptions and attitude in learning about PWDs, with implications to research on learning about social groups in general. That the effects of assistance content and contact went through complementary mediation demonstrates the indirect enhancement from such perceptions. Similarly mediation occurred in the prediction of pity-depiction content and scary content, also in the same direction thus adding to their effect. In the particular case of PWDs, it seems, different aspects of perception mediate social learning through media and interpersonal communication in similar ways to indirectly affect formation of general attitudes toward PWDs.

Overall, results from the less visited area of social learning about PWDs have shown that the social cognitive theory is applicable to socialization about PWDs in communication via symbolic modeling and contribute to the literature on communication and socialization about other social groups, with specific policy implications to PWD related civic education and communication programs (Braithwaite & Labrecque, 1994) in Hong Kong and beyond.

**Limitations and future directions.** Being a reanalysis this study is constrained in inclusion of variables, leaving out possible moderation of individual factors or other mediation in the social learning of PWDs. Given the limitation of survey studies, insights gained are to be taken with a grain of salt: self-reported attitudes typically hold certain distance to the actual behavior as a limited reflection of reality. The developmental stage of the respondents here necessitates simplistic and crude assessment of information exposure and content type and leaves something to be desired. Future work needs more refined measurement in operationalization and include more, positive communication content in effect testing (e.g., Mares & Acosta, 2008; Farnall & Smith, 1999) for a comprehensive study of information exposure in socialization.

In conclusion, this study produced evidence of ways communication factors account for students' behavioral inclination toward PWD, that content about assistance to PWD contributes to positive attitude learning and scary contents contribute negatively, while information sources cannot be overlooked either albeit with small effects.

## ENDNOTES

<sup>1</sup>A large-scale survey of primary and secondary school students, its data reanalyzed here, showed only about 37% reporting parents, about 50% reporting teachers and 30% peers as a source; almost one third (32%) reported media as the only information source, evidence that disability is generally not a topic in people's daily communication.

<sup>2</sup>Details of data collection are available from the first author upon request. We believe despite the years, the sample is reflective of the current situation given the extremely slow social change in this respect.

<sup>3</sup>The procedure works on a diagonal weight matrix with standard errors and mean-adjusted chi-square test statistic that uses a full weight matrix and returns asymptotically correct results (e.g., Muthen & Kaplan, 1992).

<sup>4</sup>This is considered to be more accurate than the normal theory confidence limits (e.g., Shrout & Bolger, 2002).

<sup>5</sup>Since  $p = .538$ , the null hypothesis that the value of RMSEA is less than or equal to .05 could not be rejected. The value of RMSEA being less than .05 was not due to chance.

<sup>6</sup>Zhao, Lynch, & Chen (2010) differentiate complementary mediation (the direct and indirect effects in the same direction) from competitive mediation (the direct and indirect effects in the opposite direction), also referred to as suppression mediation.

## References

- Allport, G. W. (1954). *The nature of prejudice*. Cambridge, MA: Perseus.
- Antonak, R. F. & Livneh, H. (1988). *The measurement of attitudes toward people with disabilities: Methods, psychometrics and scales*. Springfield, IL: Charles C. Thomas.
- Balter, L. & Tamis-LeMonda, C. S. (2003). *Child psychology: A handbook of contemporary issues*. New York, NY: Psychology Press.
- Banduras, A. (1986). *Social foundation of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality & Social Psychology* December, 51(6), 1173-1182.
- Boer, H. & Wsthoff, Y. (2006). The role of positive and negative signaling communication by strong and weak ties in the shaping of safe sex subjective norms of adolescents in South Africa. *Communication Theory*, 16, 75-90.
- Braithwaite, D. O. (1997). Understanding communication of persons with disabilities as cultural communication. In L. E. Samovar & R. A. Potter (Eds), *Intercultural communication: A reader* 8<sup>th</sup> edition (pp. 154-164). Belmont, CA: Wadsworth.
- Braithwaite, D. O. & Labrecque, D. (1994). Responding to the Americans with Disabilities Act: Contributions of interpersonal communication research and training. *Journal of Applied Communication Research*, 22, 287-294. doi: 10.1080/00909889409365403
- Casling, D. (1993). Cobblers and Song-birds: The language and imagery of disability. *Disability, Handicap & Society*, 8(2), 203–210. doi: 10.1080/02674649366780161
- Cialdini, R. B, Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, 58, 1015-1026. doi: 10.1177/01461672002610009
- Cohen, R. (1994). Preschoolers' evaluations of physical disabilities: A consideration of attitudes and behavior. *Journal of Pediatric Psychology*, 19(1), 103-111. doi: 10.1093/jpepsy/19.1.103
- Calvert, S. L. & Wilson B. J. (2008)(Eds.). *The Handbook of children, media and development*. Chichester, U.K.: Blackwell.
- Dixon, T. L. (2008). Crime news and racialized beliefs: Understanding the effects of news exposure and news orientation on perceptions of African Americans and crime. *Journal of Communication*, 58, 106–125. doi:10.1111/j.1460-2466.2007.00376.x
- Dreyer, N. A., Woods, N. F., & Sherman, A. J. (1981). ISRO: A scale to measure sex-role orientation. *Sex Roles*, 7, 173-182. doi: 10.1007/BF00287803
- Farnall, O. & Smith, K. A. (1999). Reactions to people with disabilities: Personal contact versus viewing of specific media portrayals. *Journalism and Mass Communication Quarterly*. 76 (4), 659-672. Retrieved from <http://www.aejmc.com/home/publications/jmc-quarterly/>
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity*. Englewood Cliffs, NJ: Prentice-Hall.
- Graves, S.B. (1999). Television and prejudice reduction: When does television as a vicarious experience make a difference? *Journal of Social Issues*, 55, 707-725. doi: 10.1111/0022-4537.00143
- Greenberg, B. & Mastro, D. (2008). Children, race, ethnicity, and media. In S. L. Calvert, & B. J. Wilson (Eds.). *The Handbook of children, media and development* (pp. 74 - 98). Chichester, U.K.: Blackwell.

- Hardin, B., Hardin, M., Lynn, S. & Walsdorf, K. (2001). Missing in action? Images of disability in sports illustrated for kids. *Disability Studies Quarterly*, 21, No 2. 21–32. Retrieved from <http://www.dsq-sds.org/article/view/277/304>
- Hu, L.-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1. doi: 10.1080/10705519909540118
- Hughes, D., Rodriguez, J., Smith, E., Johnson, D., Stevenson, H. & Spicer, P. (2006). Parents' ethnic-racial socialization practices: A review of research and directions for future study. *Developmental Psychology*, 42, 5, 747-770. doi: [10.1037/0012-1649.42.5.747](https://doi.org/10.1037/0012-1649.42.5.747)
- Jöreskog, K. G., & Moustaki, I. (2000). Factor analysis of ordinal variables: A comparison of three approaches. *Multivariate Behavioral Research*, 36(3), 347 - 387. doi: 10.1207/S15327906347-387
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, March, 7(1), 83-104. doi: 10.1037/1082-989X.7.1.83
- Mares, M.-L., & Acosta, E. E. (2008). Be kind to three-legged dogs: Children's literal interpretations of TV's moral lessons. *Media Psychology*. 11 (3), 377-399. doi: 10.1080/15213260802204355
- Mares, M.-L., & Woodard, E. H. (2001). Prosocial effects on Childrens' social interactions. In D. G. Singer & J. L. Singer (Eds). *Handbook of children and the media* (pp. 183-205). Thousand Oaks, CA: Sage Publications.
- Muthén, B. (1983). Latent variable structural equation modeling with categorical data. *Journal of Econometrics*, 22(1-2), 43-65. doi: 10.1016/0304-4076(83)90093-3
- Muthén, B., & Kaplan, D. (1992). A comparison of some methodologies for the factor analysis of non-normal Likert variables: A note on the size of the model. *British journal of mathematical and statistical psychology*, 45(1). Retrieved from <http://www.bpsjournals.co.uk/journals/bjmsp/>
- O'Keefe, G. J. & Reid-Nash, K. (1987). Socializing function. In C. R. Berger, & S. H. Chaffee (Eds.), *Handbook of communication science* (pp. 419-445). Newbury Park, CA: Sage.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879-891. doi: 10.3758/brm.40.3.879
- Satorra, A., & Bentler, P. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika*, 66(4), 507-514. doi: 10.1007/BF02296192
- Seiter, E. (1993). *Sold Separately: Children and parents in consumer culture*. New Brunswick, NJ: Rutgers University Press.
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, December, 7(4), 422-445. doi: 10.1037/1082-989X.7.4.422
- Strasburger, V. C. (2004). Children, adolescents, and the media. *Current Problems in Pediatric and Adolescent Health Care*, 34, 54-113.
- World Health Organization, (1980). *International Classification of Impairment, Disability and Handicaps*. Retrieved from <http://www.who.int/entity/classifications/icf/wha-en.pdf>
- Zhao, X., Lynch, J. G., & Chen, J. Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, 37(8). doi: 10.1086/651257