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# Modelling Childhood Causes of Paranormal Belief and Experience: Childhood Trauma and Childhood Fantasy

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## Summary

Using covariance structure modelling we sought to test the *childhood factors model* of paranormal belief development outlined by Irwin (1992;1993). 82 students at the University of Edinburgh were administered 3 questionnaires relating to childhood trauma, childhood fantasy, and paranormal belief and experience. 80 suitable questionnaires were completed and analysed using EQS (Bentler, 1989). The first test of Irwin's model showed that the model did not provide an adequate fit to our sample data. In particular, EQS suggested *dropping* a direct causal link from fantasy to belief and *adding* a direct link from trauma and paranormal experience. Both modifications were intuitively plausible and were implemented in a *post hoc* modified model. This new model gave an excellent fit to the data. In addition, our study replicated Irwin's (1992) finding of a small but significant correlation between childhood trauma and paranormal belief, and extends previous findings showing a small correlation between childhood fantasy and paranormal belief (and experience) to the realm of childhood fantasy, thus addressing the childhood factors model proper. In conclusion, we offer up our new model for future attempts at replication, and strongly advocate the switch to a model building approach to better understand paranormal belief and experience.

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## INTRODUCTION

Any particular person's history of paranormal belief and experience must have some beginning, and some causative factor responsible for that beginning. Until quite recently researchers on the topic of paranormal belief (PB) and experience (PE) remained unaware, or uninterested, in the possible early developmental causes of PB and PE, much of the research in this area reflecting what Irwin (1993) calls the *cognitive deficits hypothesis*- the view, influenced by a broadly skeptical research agenda, that those with high PB or PE are '...illogical, irrational, credulous, uncritical, and foolish' (Irwin, 1993, pp.16). Recently, however, research conducted by Irwin (1992) has shown the potential importance of childhood factors underlying PB, and so it is to a subset of these potentially causative correlates of PB and PE that our paper is addressed- namely, childhood trauma and childhood fantasy.

Research addressing the childhood causes of PB and PE can be traced back to a small study reported by Wilson and Barber (1983). In their study Wilson and Barber (1983) interviewed 27 women whom they had rated as excellent hypnotic subjects (with a comparison group of 25 women not so rated). The interviews centred around childhood and adult memories, fantasies and psychic experiences. As Wilson and Barber (1983) note,

"We discovered that, with one exception, the excellent hypnotic subjects had a profound fantasy life, their fantasies were often 'as real as real' (hallucinatory), and their involvement in fantasy played an important role in producing their superb hypnotic performance...Their extensive and deep involvement in fantasy seems to be their basic characteristic and their other major talents -- their ability to hallucinate voluntarily, their superb hypnotic performances, their vivid memories of their life experiences, and their talents as psychics or sensitives -- seem to derive from or to grow out of their profound fantasy life." (Wilson and Barber, 1983, pp.340).

Further still, one of the most significant factors in differentiating between fantasiers and non fantasiers in Wilson and Barber's group was the incidence of childhood trauma (this relationship had previously been found by Hilgard (1970, 1974)). Of the 27 fantasiers, nine (33%) reported having experienced some difficult or stressful event in their early life, ranging from physical abuse by parents, or a mother with emotional problems, to unstable living conditions. No subjects in the comparison group reported having experienced any childhood trauma. As Lynn and Rhue (1988) concluded, in a follow up study which replicated Wilson and Barber (1983) earlier findings, many fantasiers seem to use fantasy as an escape from insecure real world events in early childhood.

Since Wilson and Barber's study, two studies elaborating on the fantasy proneness-PB relationship have been conducted by Irwin (1990; 1991). In the first of these studies, Irwin (1990) administered Myer's (1983) version of the Inventory of Childhood Memories and Imaginings (ICMIC) to 92 people, along with Tobacyk and Milford's (1983) Revised Paranormal Belief Scale (PBS). Irwin found Pearson correlations of .48, .58, and .43 for the Psi Belief, Spiritualism, and Precognition subscales of the PBS respectively with scores on the ICMIC (all significant at  $p < 0.001$ ), suggesting some definite correlation between imaginal involvement and the core constructs of PB. In a follow up study, Irwin (1991) administered the ICMIC and PBS to 122 students at the University of New England, Australia, and found a similar pattern of correlations- the PBS Psi Belief, Spiritualism, and Precognition subscales correlated .40, .42, and .34 with the ICMIC (all significant at  $p < 0.001$ ). Another study by Rao (1992) looked at the relationship between fantasy proneness and PE alone as measured by Neppe's (1993) Subjective Paranormal Experiences Questionnaire (SPEQ). Rao found a correlation of .46 ( $p < 0.01$ ) between the SPEQ and the ICMIC, replicating Wilson and Barber's finding that fantasy prone participants reported more psychic experiences.

On the topic of childhood trauma and PB Irwin (1992) administered the PBS (Tobacyk, 1988), and the Survey of Traumatic Childhood Experiences (STCE) (Council and Edwards, 1987) to 72 students. He found a pearson correlation of .21 ( $p > .05 < .08$ ) between the full scale PBS score (including items of dubious paranormality about the Loch Ness monster and life on other planets) and the STCE; a non-significant result which is at least suggestive. Those items most strongly correlated with PB were the STCE items relating to intrafamilial physical abuse ( $r = .31, p < .05$ ). Thus there is some evidence to support the view that childhood trauma has an influence on the subsequent

[INSERT FIG. 1 ABOUT HERE]

development of PB, almost certainly via the mediating influence of fantasy (during child and adulthood). In suggesting his own model of these relationships Irwin concludes,

“Under the model presented here, fantasy proneness...is a central mediating variable in the development of paranormal beliefs. Fantasy proneness may be kindled in early childhood through parental encouragement and/or the incidence of traumatic experiences. In particular, the latter will instill a strong need for interpersonal control. Given a conducive social context, fantasy proneness and the associated need for control may lead to the formation of paranormal beliefs. Fantasy proneness...also may be a factor in the occurrence and/or acknowledgement of parapsychological experiences.”  
(pp. 206)

Irwin's tentative model of the origins and functions of PB is reprinted in figure 1. With respect to his model, Irwin notes, "Most of the relationships indicated by the arrows have now been documented in the empirical literature, but there remains a need for a single study entailing a path analysis of all variables encompassed by the model." (Irwin, 1992, pp. 205).

[INSERT FIG.2 ABOUT HERE]

In this study we attempt at least a partial confirmation of Irwin's model, using a technique slightly more advanced than path analysis, namely covariance structure modelling (CSM) using EQS (Bentler, 1989), a program specifically designed to implement and test structural equation models using covariances. Using a slightly more simplified version of Irwin's model (see fig. 2) we aim to test the causal structure underlying the relations between childhood trauma, childhood fantasy, PE and PB. No study has to date looked specifically and exclusively at the role of *childhood* fantasy involvement in the development of PB and PE, but we feel that an emphasis on childhood fantasy, as opposed to the mixed effects of child and adult fantasy (as measured by the ICMI) is important given the proximity of childhood fantasy, and its pertinence to traumatic events in childhood.

## METHOD

### *Subjects*

The respondents were 82 students and friends of the last four authors, all at the University of Edinburgh. Unfortunately no information on sex or age was taken, but the sample was broadly similar to those that one usually gets from university students.

### *Materials*

A 61 item questionnaire was constructed using items from the following three scales;

(1) Survey of Traumatic Childhood Experiences (STCE) -- This scale, developed by Council and Edwards (1987), comprises 30 items dealing with events that may cause trauma in a child's life. The full 30 item scale was used in this study. The scale has items relating to intrafamilial sexual and physical abuse, loss related to friends and family, extrafamilial sexual abuse, assault, loss of home and property, isolation and personal malady, adolescent abortion/miscarriage, and parental divorce/separation. Responses are scored on a 5 point scale of frequency, with (A) none, (B) one, (C) two to five, (D) six to ten, and (E) more than ten traumatic experiences.

(2) Australian Sheep-Goat Scale (ASGS) -- This scale comprises 18 items referring to three common components of PB; ESP, PK, and Life after Death. Thalbourne and Delin (1993) report reasonable reliability and some evidence showing concurrent validity. Items refer to PB and PE and were marked by a 7 point scale.

(3) Childhood fantasy -- This construct was measured using only those items from Myers' (1983) ICMIC that refer to childhood fantasy. Items are scaled dichotomously, in the true/false format. High scores indicate high fantasy.

### *Procedure*

Participants were given the three-scale questionnaire to fill in, along with a blank envelope for the completed questionnaire to be placed in to preserve the participant's anonymity. Participants were asked to fill in the questionnaire as honestly as possible. Once the questionnaire was completed and sealed in the envelope the participant was briefed about the nature of the study. No participants reported having any particular problem with the content of the scales, though some pointed out that the Australian Sheep-Goat Scale was quite contorted in its wording. Once the data had been collected they were entered in to Statview for calculation of the correlation matrix, before being entered into EQS for covariance structure modelling. At this stage two participant's questionnaires were excluded from the analysis, as they constituted extreme outliers on Trauma, and one of the subjects had (amongst other

unlikely) claimed to have had more than ten abortions/miscarriages! Consequently, we suspected that at least one of the two outliers was not responding honestly. The remaining sample comprises 80 individuals.

### *Statistical Methods*

Correlational data from this study were analysed using the technique of covariance structure analysis using EQS (Bentler, 1989). EQS combines factor analysis, multiple regression, and path analysis techniques, providing a powerful system to test and confirm various causal or structural models. The most important output from a test of any causal model is a list of goodness of fit statistics, indicating how well the hypothesised model accounts for the observed correlational structure of the data. When assessing the goodness of fit of a causal model there are a number of statistics which we have at our disposal. For the first of these, the chi square goodness of fit statistic, we require that the chi square be *non-significant* for our model to be considered a good fit. Next we have average standardised residual statistics, of which the off diagonal residuals are the most important. These may be treated like residuals in regression analysis, indicating unexplained variance, and are particularly useful in comparing the differences in fit between two or more alternative models. With Aikake's Information Criterion (AIC) chi-square, and Bozdogan's version (CAIC), we have a means of assessing goodness of fit that takes into the account the parsimony of the underlying model (in terms of the number of parameters that must be estimated to arrive at a particular solution). Thus the smaller the value the better, for either of these statistics. Lastly, we have the fit indices; Bentler and Bonett's normed (NFI) and non-normed fit index (NNFI), and the comparative fit index (CFI). Of particular importance for us is the NNFI, which provides a particularly good estimate of model fit with small sample sizes. To even be considered as a reasonable fit, the fit indices should show values of greater than 0.9.

Lastly, a useful feature of causal modelling is the suggestion of model modifications, whereby EQS suggests changes to the model in order to provide better fit. Used cautiously, this feature is helpful in achieving models which fit the data well.

## RESULTS

[INSERT TABLE. 1 ABOUT HERE]

Descriptive statistics for the four primary variables are given in table 1. Table 2 gives the descriptive statistics for childhood trauma, split into its various sources. Whilst all of the variables in table 1 gave reasonable approximations to a normal distribution, this was not the case for the variables presented in table 2. Of these, only intra-familial physical abuse data showed evidence of being normally distributed, the other variables being more chi-squared in their distribution. For table 2 it is clear that most participants had neither experienced much childhood trauma, nor collectively displayed much variation in trauma experienced. This is particularly the case for familial sexual abuse, almost all participants reporting no sexual abuse in their family as children. Consequently, for correlational analyses on the four main variables we used Pearson product moment correlation coefficients, but for analyses on specific traumatic factors we chose to use Spearman's rho, corrected for ties.

[INSERT TABLE 2. ABOUT HERE]

From tables 2 and 3 we can determine how well our study has replicated previous findings on the relation between PE and belief, with fantasy and trauma. With respect to childhood fantasy we may note from table 3 that the Pearson correlation between fantasy and PB is  $r = .27$  ( $p < .05$ ). This result fits reasonably with the studies of Irwin (1990; 1991) showing average correlations of around .44 between the ICMI and the core correlates of PB. Further, our own reported correlation is likely to be smaller



simply because we were measuring childhood fantasy. Clearly we cannot expect childhood estimates of fantasy involvement to correlate as highly with present day PB as would estimates based upon contemporary fantasy involvement.

[INSERT TABLE 3. ABOUT HERE]

The relationship between childhood fantasy and PE was slightly stronger,  $r=.31$  ( $p<.01$ ). When the expected smaller correlation due to measurement of *childhood* fantasy is taken into account, this result offers a fair degree of agreement with the findings of Rao (1992) with the ICMI ( $r=.46$ ).

Our main result for childhood trauma exactly replicates that of Irwin (1992). This is particularly encouraging, given our use of a much narrower measure of PB. Clearly we are dealing with a fairly small effect given the marginal levels of significance found in both studies. However, we failed to replicate Irwin's *post hoc* finding that the strongest traumatic correlate of PB was intra-familial physical abuse. Our data show that the strongest predictor of PB were the items relating to 'loss of property'. This is interesting, in that scores for this predictor stemmed mostly from answers to an item relating to the frequency of moving home as a child.

Indeed, the correlations between the various factors of childhood trauma and PB and experience are interesting in so far as they show that the strength and significance of the correlations reported is much stronger for trauma and experience than it is for belief. Here we see the inklings of a model relating these factors, and it is to the modelling of these factors proper that we now turn.

#### *Results of Causal Modelling*

[INSERT TABLE 4. ABOUT HERE]

First we ran EQS on a slightly simplified version of Irwin's (1992) model, given in figure 2. The results for this model, in terms of fit statistics, are given in the appropriate column of table 4. The chi-square of 5.544 on 2 degrees of freedom indicates a near significant lack of fit between the model and the observed data. Equally the fit indices confirm the lack of fit, two out of the three fit statistics show results less than the minimum fit level of 0.9. The fit index for the NNFI is particularly poor, all the worse given that this index is best for reflecting fit at low sample sizes. In short, Irwin's model is a poor fit.

EQS made a number of recommendations for changes to Irwin's model. Firstly, the Wald test for dropping parts of the model suggested the exclusion of the direct causal link from fantasy to belief. Secondly, the Lagrange Multiplier test for adding parts to the model suggested the inclusion of a direct causal link between trauma and PE. Consequently, we made these changes to the model, arriving at a much more streamlined model, whereby trauma causes fantasy causes experience causes belief, with a direct link from trauma to experience (we had actually considered modelling this model previously, minus the trauma-experience link).

[INSERT FIGURE 3. ABOUT HERE]

The results for the test of this model are given in the last column of table 4. Clearly, the new model is a considerable improvement. Chi square, fit indices and residuals all indicate an excellent degree of fit for this model. AIC and CAIC statistics, plus residuals, show that this model is considerably better than Irwin's in reproducing the covariance found in the original data. In figure 3 we provide a graphical representation of this model, with path coefficients. It is to a discussion of these results that we now turn.

## DISCUSSION

The results of our study provide both confirmation and disconfirmation of previous findings. The correlation between childhood trauma and PB, whilst of marginal significance, was exactly the same as that found by Irwin (1992). This is particularly encouraging given that the measure of PB used in this study is far narrower in content than the PBS used by Irwin. Also the previous findings of a relation between fantasy, PB and PE, were confirmed, whilst also being extended to the influence of childhood fantasy.

More importantly we found that Irwin's proposed model of the causes of PB, as it applies to the variables we studied, did not provide a good fit to the data. The central problem for Irwin's model was the inclusion of a direct effect of fantasy on PB. The data simply provided insufficient support for this link, and it certainly makes more sense to suppose that any direct effects of heightened fantasy involvement would be felt upon PE, rather than PB. However, of particular interest is the finding that a much better fit stems from the inclusion of a direct link between trauma and PE, not an obvious result by any means. According to the new model trauma has two causal routes in its influence on PE, one direct, the other indirect.

Research such as we have reported is building up an interesting and, we think, insightful picture of the causes of PE and PB. The evidence we report adds strong weight in favour of the view that traumatic events in childhood are a partial cause of heightened fantasy, and that the development of heightened fantasy has consequences for PE. Further still, trauma gives rise to PE directly, a finding which we may explain only once we have been able to determine the specific traumatic causes responsible for the direct route to PE. From a *post hoc* perusal of our data we would like to suggest a possible cause of the two routes to paranormal experience (from trauma). It may be that the direct link stems from the victims response to bereavement related trauma. A pervasive wish to bring back a loved

one may be supposed to increase the likelihood of hallucinating their presence (indeed, studies of bereavement have shown this to be the case for some people).

The indirect route to PE via childhood fantasy almost certainly stems from the victims concerns about the loss of control of social and domestic domains, as Irwin's larger model suggests. Physical and sexual abuse, frequently moving home, long periods of isolation due to travel or illness, may all leave a child feeling as though they are powerless to control events in their life. In the struggle to regain control, some may turn inwards to their own uniquely private inner life, of fantasy friends and make believe realms, and in doing so they may permanently open doors to heightened visualisation ability.

Whilst these results may have a sceptical explanation in terms of increased exposure to hallucination and vivid imagination, this explanation in itself requires, and cannot explain, the existence of PBs. On the sceptical account PBs are needed prior to experience, to provide the interpretative framework within which mere hallucinations may be regarded as ostensibly paranormal. But as our new model shows, PB is best modelled as a consequence, rather than a cause, of PE. This is an important result, if it can be substantiated by further research on larger samples, precisely because Irwin's original model is equivocal with respect to the effects of fantasy on PB and PE, and PB and PE themselves are supposed to show reciprocal causation with one another. If, as our model suggests, PE experience is more the result of fantasy proneness, and PB is more the result of PE, then this suggests a more phenomenological explanation for PB, over a more attributional one (i.e. that one has PB and then attributes paranormality to hallucinatory experiences). In short, where PE has previously been considered the younger brother to PB, our research suggests that it is more the 'paternal cause' of PB.

Researchers in this area are only just beginning to form a picture of the causes and consequences of PB and PE. We commend the kind of model building approach that Irwin (1993) has

employed. With the modelling techniques we have used to test Irwin's model, we feel that future research can begin to move away from the rather atheoretic, piecemeal, and simple correlational approach to PB and PE, towards techniques and ideas that can enable us to truly come to understand those who experience paranormal phenomena, and those who hold paranormal beliefs.

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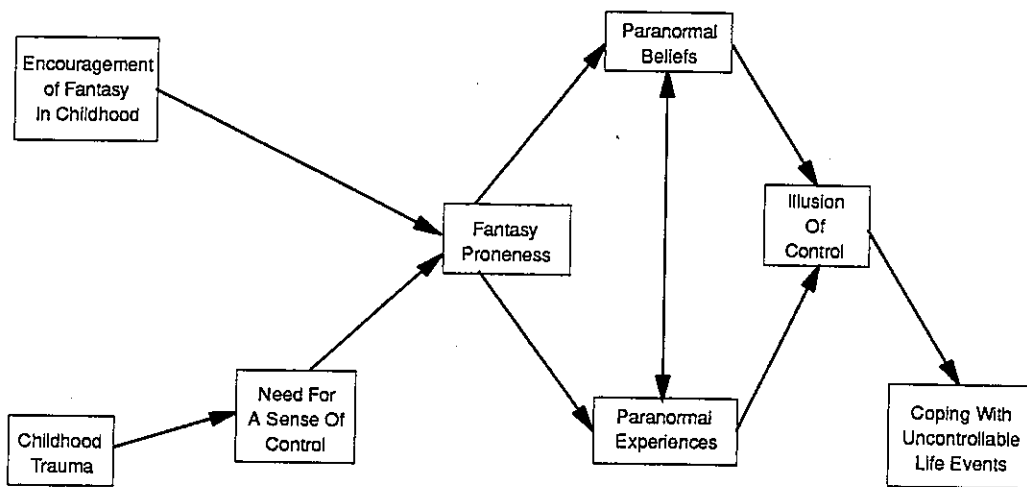


Figure 1. Irwin's (1992) general graphical model of paranormal belief.

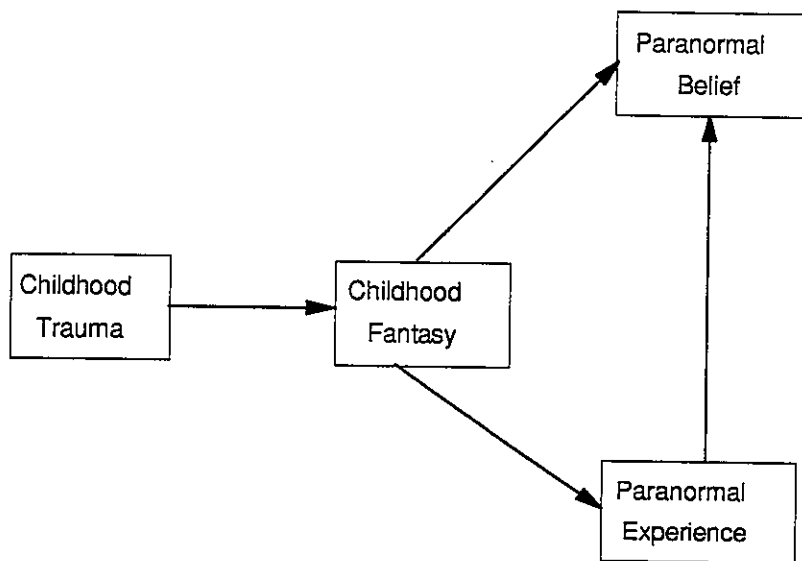


Figure 2. A simplification of Irwin's (1992) model depicting the childhood causes of paranormal belief.

Table 1.  
Descriptive statistics for the four main variables

Variable	Mean (N=80)	S.D.
Childhood Trauma	47.06	8.13
Childhood Fantasy	6.46	3.02
Paranormal Belief	22.54	5.75
Paranormal Experience	27.92	9.55

Table 2. Descriptive statistics for specific sources of childhood trauma, with correlations given for paranormal belief and paranormal experience.

Source of Childhood Trauma	Mean	S.D.	Corrected Spearman rho (Belief)	Corrected Spearman rho (Experience)
Intra-familial sexual abuse	1.04	0.16	-.008	.058
Intra-familial physical abuse	2.49	0.92	.196 *	.194 *
Loss (friend)	1.28	0.45	-.024	.23 **
Extra-familial sexual abuse	1.28	0.47	-.038	.086
Loss (family)	1.63	0.56	.110	.164
Isolation	1.35	0.67	.064	.056
Personal Illness	1.40	0.54	-.039	.194 *
Parental Divorce/Miscarriage	1.09	0.19	.031	.137
Assault	1.57	0.69	-.094	.18
Loss of Property (Home Moving)	1.52	0.40	.379 ****	.239 **
Robbery/Mugging	1.12	0.37	.065	.251 **

\*  $p < 0.09 > 0.05$ , \*\*  $p < 0.05$ , \*\*\*\*  $p < 0.001$

Table 3. Pearson correlations between the four main variables

Variable	Trauma	Fantasy	Experience
Fantasy	.356***	--	--
Experience	.343***	.315***	--
Belief	.215*	.271*	.534*****

\*  $p < 0.06 > 0.05$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , \*\*\*\*\*  $p < 0.0001$



Table 4. Causal Model Fit Statistics for Irwin's (1992) and the New Model

MODEL FIT STATISTICS	Irwin's Model (fig.2)	New Model (fig.3)
Average absolute standardised residuals	0.035	0.014
Average off-diagonal absolute standardised residuals	0.058	0.022
Independence Model Chi-Square ( <i>df</i> )	52.332 (6)	
Independence AIC	40.332	40.332
Model AIC	1.544	-2.691
Independence CAIC	20.040	20.040
Model CAIC	-5.220	-9.455
Chi-Square ( <i>df</i> )	5.544 (2)	1.309 (2)
Chi-Square <i>p</i> -value	0.0625	0.520
Normal theory RLS Chi-Square	5.354	1.298
Bentler-Bonett Normed Fit Index	0.894	.975
Bentler-Bonett Non-Normed Fit Index	0.771	1.045
Comparative Fit Index	0.924	1.000

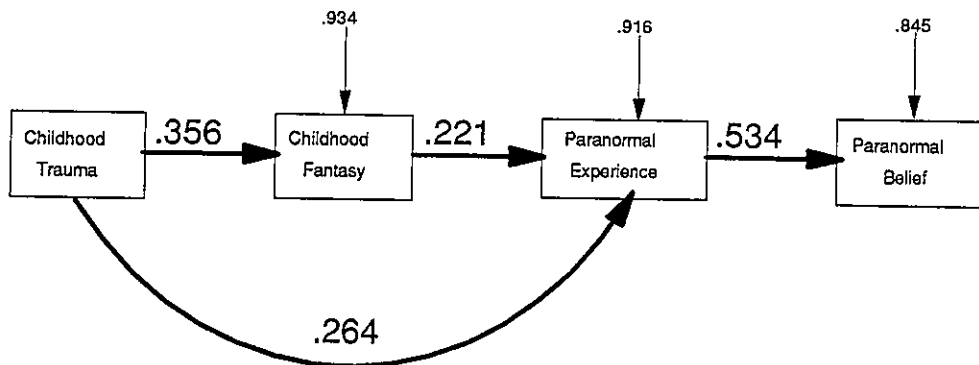


Figure. 3 The new model of the childhood causes of paranormal belief and experience.