

Intolerance of Uncertainty and Psychological Well-being of Chinese Children Living in Hong Kong: The Mediating Role of Children's Hope

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Abstract

This study examined the relationship between intolerance of uncertainty, hope, and psychological well-being among Chinese children living in Hong Kong. Using cross-sectional survey data from 3,303 Primary Five and Primary Six students across 31 primary schools, the study assessed intolerance of uncertainty, hope, and three indicators of subjective well-being: life satisfaction, positive affect, and negative affect. Academic stress and socio-demographic factors were controlled in the analyses. Results showed that intolerance of uncertainty was positively associated with life satisfaction and negative affect, but was not directly related to positive affect. Children's hope was significantly and positively associated with life satisfaction and positive affect, and negatively associated with negative affect. Mediation analyses indicated that hope partially mediated the association between intolerance of uncertainty and life satisfaction, fully mediated the association between intolerance of uncertainty and positive affect, and operated as a protective buffer in relation to negative affect. These findings suggest that intolerance of uncertainty is not uniformly maladaptive in this context; instead, it may be linked to both vulnerability and adaptive processes, depending on the dimension of well-being considered. In particular, children who are more sensitive to uncertainty may also engage in future-oriented thinking that supports hope and, in turn, promotes well-being. The study highlights the importance of considering cultural and contextual factors when examining uncertainty in children's lives, especially in highly competitive educational settings. It also suggests that interventions aimed at promoting children's well-being should not focus solely on reducing uncertainty, but also on strengthening hope and meaning-making.

Introduction

Anxiety about academic performance is a major source of strain for children in Hong Kong and other East Asian societies, where school success is highly emphasised and linked to pressure, competition, and future expectations (Chyu & Chen, 2024; Shek et al., 2021). Research on academic stress shows that stressful academic circumstances can contribute to psychological distress, including anxiety and depression (Chyu & Chen, 2022; Shek et al., 2021). Because of this, academic stress is an important contextual factor when examining children's psychological well-being, particularly in East-Asian and Chinese societies (Chyu & Chen, 2024).

At the same time, children are also growing up in conditions where uncertainty is difficult to avoid. The literature on intolerance of uncertainty suggests that uncertainty itself can be experienced as stressful and emotionally draining, especially when individuals interpret ambiguous situations as threatening (Buhr & Dugas, 2002; Carleton et al., 2007). In educational settings, uncertainty can intensify worry and make coping more difficult, which may worsen well-being (Carleton et al., 2007; Huntley et al., 2020). This makes intolerance of uncertainty especially relevant for children facing both academic demands and future-related concerns (Chyu & Chen, 2024; Cornacchio et al., 2018).

Studies of academic stress indicate that demands from school and parents can heighten distress, while the broader stress process is shaped by how individuals appraise threats and their coping resources (Chyu & Chen, 2024). The transactional model of stress highlights that stress is not only about exposure to demands, but also about how people evaluate and respond to those demands (Chyu & Chen, 2024). Likewise, intolerance of uncertainty can be understood as a dispositional tendency that shapes how people appraise ambiguity and possible negative outcomes (Buhr & Dugas, 2002; Yang, 2013). Taken together, these perspectives suggest that uncertainty may be a meaningful psychological burden in addition to academic pressure (Buhr & Dugas, 2002; Chyu & Chen, 2024).

This study therefore focuses on the association between intolerance of uncertainty and psychological well-being among Chinese children in Hong Kong, while accounting for academic stress as an important contextual influence. Previous research has shown that academic stress is associated with psychological distress, whereas intolerance of uncertainty has been linked to worry, anxiety, and other emotional difficulties (Buhr & Dugas, 2002; Chyu & Chen, 2024; Huntley et al., 2020). Building on this literature, the present study examines whether intolerance of uncertainty is uniquely associated with lower psychological well-being after controlling for academic stress (Chyu & Chen, 2024; Cornacchio et al., 2018). By statistically accounting for the influence of academic stress, a major source of stress experienced by children in Hong Kong, the study seeks to clarify the unique contribution of intolerance of uncertainty to children's psychological well-being and thereby provide a more nuanced understanding of how intolerance of uncertainty operates within the Hong Kong context.

Literature Review

Intolerance of Uncertainty and Children's Psychological Well-being

Intolerance of uncertainty refers to the tendency to view uncertain situations or the possibility of negative events as unacceptable, even when the probability of harm is small (Buhr & Dugas, 2002). It is also described as a dispositional negative orientation toward ambiguity and future events, where uncertainty is experienced as stressful, upsetting, and difficult to tolerate (Carleton et al., 2007; Yang, 2013). In this view, uncertainty is not merely a neutral absence of information but a condition that can trigger distress, worry, avoidance, and inaction (Buhr & Dugas, 2002; Carleton et al., 2007). Empirical findings consistently show that intolerance of uncertainty is strongly linked to worry and anxiety (Buhr & Dugas, 2002; Carleton et al., 2007). Early studies found that intolerance of uncertainty and worry are highly related, and that this association remains even after accounting for anxiety and depression (Buhr & Dugas, 2002; Yang, 2013). Other work shows that intolerance of uncertainty is associated with broader emotional and anxiety-related problems, including obsessive-compulsive symptoms, panic sensations, and depressive symptoms (Carleton et al., 2007; Cornacchio et al., 2018). These findings support the view that intolerance of uncertainty is not just a narrow worry-related trait but a broader vulnerability factor for psychological difficulties (Buhr & Dugas, 2002; Carleton et al., 2007).

More recent research extends this evidence to children, adolescents, and student populations. In youth, intolerance of uncertainty has been associated with multiple anxiety domains and internalising problems, and meta-analytic evidence shows robust links with anxiety and worry (Cornacchio et al., 2018; Huntley et al., 2020; Osmanağaoğlu et al., 2021; Rifkin & Kendall, 2020). In educational contexts, intolerance of uncertainty has also been positively associated with test anxiety and related emotional distress, suggesting that uncertainty can amplify stress in achievement settings (Huntley et al., 2020). Taken together, the evidence indicates that higher intolerance of uncertainty is likely to undermine psychological well-being across age groups and contexts (Cornacchio et al., 2018; Huntley et al., 2020).

Based on the literature showing that academic stress is associated with mental distress and that intolerance of uncertainty is linked to worry, anxiety, and other internalising symptoms, the present study proposes that intolerance of uncertainty will be negatively related to psychological well-being (Chyu & Chen, 2024; Buhr & Dugas, 2002; Huntley et al., 2020). Because academic stress may also influence well-being, it will be controlled in the analysis so that the unique contribution of intolerance of uncertainty can be examined more clearly (Chyu & Chen, 2024). Therefore, Hypothesis 1 is that intolerance of uncertainty will negatively associate with the psychological well-being of Chinese children in Hong Kong after controlling for academic stress and sociodemographic variables.

Children's Hope and Psychological Well-being

Hope has been conceptualised as a cognitive-motivational construct comprising two interrelated components: agency and pathways (Snyder, 1995; Snyder et al., 1997). Agency reflects children's self-related belief in their capacity to initiate and sustain movement toward a desired goal, essentially the perceived willpower to pursue that goal, whereas pathways reflect children's perceived ability to generate workable routes toward reaching that goal (Snyder et al., 1997; Valle et al., 2004). Because these two components are theorised to operate synergistically, overall hope is best understood as the combination of goal-directed determination and the cognitive capacity to plan ways of meeting goals, rather than either component alone (Ling et al., 2021; Snyder et al., 1997).

This dispositional quality is commonly assessed among children aged 8 to 16 years using the Children's Hope Scale, a brief six-item self-report measure that has demonstrated satisfactory reliability and validity across diverse child and adolescent populations, including Chinese samples (Ling et al., 2021; Ng et al., 2014; Snyder et al., 1997).

A growing body of research indicates that hope is closely tied to children's psychological well-being. Higher-hope children and adolescents have consistently been found to report greater life satisfaction, higher self-esteem, more positive interpersonal relationships, and greater optimism, along with fewer internalising and externalising problems (Ling et al., 2021; Marques & Lopez, 2014; Valle et al., 2004). This pattern also extends to Chinese children in Hong Kong: hopeful thinking has been shown to predict life satisfaction among underprivileged children in the city (Ng et al., 2014), and among low-income Hong Kong youths, hope similarly predicts broader indicators of psychosocial adjustment, including goal setting, academic aspiration, and reduced economic worry about the future (Ng et al., 2014). Taken

together, this literature suggests that hope functions as a psychological resource that promotes children's well-being across cultural and socioeconomic contexts (Ng et al., 2014, 2017).

Given this consistent pattern of association between hope and favourable indicators of psychological adjustment in both non-Chinese and Chinese samples of children, hope is expected to relate positively to children's psychological well-being in the present study. Because hope reflects children's confidence in both their goal-directed motivation (agency) and their capacity to devise ways of achieving desired outcomes (pathways), a stronger sense of hope should equip children with greater psychological resources to sustain positive functioning (Snyder et al., 1997; Valle et al., 2004). Therefore, Hypothesis 2 is that sense of hope will positively associate with the psychological well-being of Chinese children in Hong Kong.

The Potential Mediating Effect of Hope on the Relationship between Intolerance of Uncertainty and Psychological Well-being

We premised that children's hope will mediate the effect of intolerance of uncertainty on psychological well-being. This premise rests on the assumption that a sense of hope can help children make sense of uncertainties and influence their coping behaviour, given that hope is inherently goal-directed (Svendsen, 2024). Hope can also reflect a child's ability to imagine routes to his or her goals (pathways) and his or her self-related beliefs concerning the ability to follow those routes toward goal achievement (agency) (Valle et al., 2004). Accordingly, children who are intolerant of uncertainty may, through diminished pathways and agency thinking, be less able to identify workable ways of responding to ambiguous or threatening situations, which in turn may undermine their psychological well-being. Conversely, children who maintain a stronger sense of hope may be better equipped to reinterpret uncertain circumstances as surmountable rather than threatening, thereby buffering the adverse impact of intolerance of uncertainty on well-being.

Preliminary empirical support exists for the role of hope as a mediating mechanism in children's and adolescents' coping with adversity, social stress, and uncertainty. Early hope research already identified the mediator properties of hope in children's coping activities as a priority area warranting further investigation (Snyder et al., 1997). Subsequent studies lend support to this proposition: hopefulness has been found to mediate the relationship between school connectedness and adolescent violence, suggesting a protective, mediating function of hope under conditions of social and emotional stress (Stoddard et al., 2011). Similarly, among low-income youths in Hong Kong, hope has been shown to mediate the influence of relational and community support on positive psychosocial adjustment, including the mitigation of economic worry about the future (Ng et al., 2017). These findings lend support to the notion that hope may operate as a mediating pathway that helps children translate the uncertain situations they encounter into more adaptive coping responses, thereby shaping their psychological well-being.

Building on this theoretical premise and the preliminary empirical evidence for hope's mediating role in children's coping with adversity and uncertainty, hope is expected to help explain the association

between intolerance of uncertainty and psychological well-being. Specifically, children who are more intolerant of uncertainty are expected to report lower levels of hope, characterised by reduced agency and pathways thinking, which in turn is expected to undermine their psychological well-being. Therefore, Hypothesis 3 is that sense of hope will mediate the negative association between intolerance of uncertainty and psychological well-being among Chinese children living in Hong Kong.

Using Children's Subjective Well-being to Measure Their Psychological Well-being

In the present study, children's psychological well-being is operationalised through their subjective well-being (SWB), following Diener's (1984) two-component structure comprising a cognitive component and an affective component (Shek & Liang, 2018). The cognitive component is typically captured through life satisfaction, defined as an individual's global evaluative judgement of his or her life circumstances at a particular point in time (Author a; Shek & Liang, 2018), while the affective component reflects the relative presence of positive affect and the relative absence of negative affect experienced in daily life (Author a; Qiu et al., 2008). This two-component conceptualisation of SWB, encompassing life satisfaction alongside positive and negative affect, has been widely adopted in research on children's and adolescents' psychological well-being, including studies conducted with Hong Kong Chinese populations (Author a, b; Shek & Liang, 2018). Accordingly, the present study measures the psychological well-being of Chinese children in Hong Kong using indices of life satisfaction alongside positive and negative affect, so as to capture both the evaluative and emotional dimensions of their subjective well-being.

Methodology

Sampling

We administered a cross-sectional quantitative survey to Primary Five and Primary Six students, as this age group is entering pre-adolescence and may face heightened uncertainty in life. These students also experience intense competition to secure places in more desirable secondary schools, which may subject them to elevated levels of academic stress. Furthermore, children at this stage are better equipped to comprehend the survey items, which addressed responses to uncertainty, sense of hope, life satisfaction, and emotional well-being—constructs that may be too abstract for younger children to grasp.

In Hong Kong, children are entitled to six years of free universal primary education. According to the Student Enrolment Statistical Report (Education Bureau, 2025), a total of 109,318 students were enrolled in Primary Five and Primary Six in the 2024/25 academic year. As this study was commissioned by Hong Kong Caritas, all 56 primary schools operated by the Catholic Diocese of Hong Kong and by religious congregations in Hong Kong were invited to participate. Among the schools that agreed to take part, all Primary Five and Primary Six students of Chinese nationality were invited to participate.

Although these schools are operated under the Catholic Diocese of Hong Kong, their student populations are not necessarily Catholic. Participants' religious affiliation was recorded in the survey, and its potential effects were controlled for during data analysis.

In total, 31 schools and 3,303 students participated in this quantitative survey.

Data Collection

Prior to data collection, ethical approval was obtained from the institutional review board of the affiliated university **[Blinded for Review]**. Permission was also obtained from school principals to conduct the research, and written consent was obtained from both students and their parents before participation.

During data collection, trained data collectors briefed participants on the study's objectives and assured them of the confidentiality of their information. Participants then completed the questionnaire, with assistance from data collectors as needed. All data were treated with strict confidentiality, and no personal information was disclosed to unauthorised parties.

Measurements

Measurement of Children's Intolerance of Uncertainty

The Short Version of the Intolerance of Uncertainty Scale (IUS-12) is a brief, psychometrically validated self-report instrument developed by Carleton et al. (2007) and translated by Zhang et al. (2017) to assess an individual's tendency to react negatively to uncertain situations. It was also applied and tested in children and student samples (e.g., Cornacchio et al., 2018). Although the IUS-12 comprises 12 items designed to capture two core dimensions of intolerance of uncertainty (IU)—prospective anxiety (i.e., fear and worry about future events) and inhibitory anxiety (i.e., paralysis or avoidance in response to uncertainty)—recent factor-analytic research has examined whether a general IU factor may underlie all items of the scale. For example, Hale et al. (2016) found stronger support for a model specifying a general IU factor than for a two-factor model. These findings suggest that the IUS-12 may be more appropriately scored as a unidimensional measure using a total score rather than as two separate subscales. The findings of a confirmatory factor analysis of the current sample also indicated that the goodness-of-fit indices of a one-factor measurement model were acceptable (CFI = .94, TLI = .90, RMSEA = .06). Therefore, the whole scale of the IUS-12 was used to test the hypotheses. The reliability coefficient of this measure in the current study is .83.

Measurement of Children's Hope

To measure children's hope, the Children's Hope Scale (CHS) developed by Snyder et al. (1997) and translated by Ng et al. (2014) was adopted. There are 6 items in total, including statements like "I am

doing just as well as other kids my age” and “Even when others want to quit, I know that I can find ways to solve the problem”. The reliability coefficient of this measure in the current study is .78.

Measurement of Children’s Subjective Well-being

Children’s Life Satisfaction: To measure children’s life satisfaction, the Satisfaction with Life Scale (SWLS) developed by Diener et al. (1985) and translated by Shek (1992) was adopted to measure the cognitive aspect of subjective well-being. The SWLS is a 5-item scale, including statements like “I am satisfied with my life”. The reliability coefficient of this measure in the current study is .80.

Children’s Emotional Well-being: To measure children’s emotional well-being, the Positive and Negative Affect Schedule was adopted (Author a; Qiu et al., 2008). There are 18 items in total, which consist of two sets of positive and negative affect sub-scales, including items like: “Excited”, “Angry”, “Happy”, and “Upset”. The reliability coefficient of the measure of the positive affect is .90, and the reliability coefficient of the measure of the negative affect is .89 in the current study.

Control Variables

Measurement of Academic Stress

Academic stress was measured using a set of 17 items designed to capture students’ emotional responses to various academic-related experiences. The construct was conceptualised as a variable comprising four components (Chyu & Chen, 2022). These included: academic expectations from parents (five items), academic expectations from teachers (three items), academic expectations from the students themselves (six items), and excessive academic demands (three items). Example items include: “I will blame myself if I cannot satisfy my parents’ academic expectations” (parental expectations), “If I have a poor performance in school, I think they are disappointed in me” (teacher expectations), “If I cannot meet my own expectations, I am not good enough” (self-imposed expectations), and “The assessments and examinations are too much for me, and I feel that they are unbearable” (excessive demands). The reliability coefficient of this measure in the current study is .92.

Socio-demographic Variables

Socio-demographic variables (including gender, age, grade, religion, place of birth, fathers’ educational level, mothers’ educational level, parents’ marital status, number of family members, and perception of family financial situation) would first be entered in Step 1 of the regression model to control their influences if those variables were found to relate to psychological well-being.

Data Analysis

The demographic information of respondents was reported through descriptive statistics. Pearson’s correlation analysis was conducted to explore the correlations among all study variables, including the main control variable (i.e., academic stress), the independent variable (i.e., the intolerance of

uncertainty), the mediating variable (i.e., children's hope), and the dependent variables (i.e., life satisfaction, positive affect, and negative affect).

Then, multiple regression analyses and mediation analyses were conducted to test the hypotheses. First, the socio-demographic variables (including gender, age, grade, religion, place of birth, fathers' educational level, mothers' educational level, parents' marital status, number of family members, and perception of family financial situation) were entered in Step 1 of the regression model to control their influences if those variables were found to relate to subjective well-being. Academic stress was entered in Step 2. Intolerance of uncertainty was entered in Step 3. Children's hope was entered in Step 4. Finally, three simple mediation analyses were conducted using the PROCESS macro (Hayes, 2022), with intolerance of uncertainty specified as the independent variable, children's hope as the mediator, and academic stress and related socio-demographic variables as covariates. Three indicators of psychological well-being—life satisfaction, positive affect, and negative affect—were examined as outcome variables in three separate mediation models. The statistical significance of the mediating variable was examined using 5,000 bootstrap samples, which produced 95% confidence intervals (CIs) for the indirect effect. According to Hayes' (2022) guidelines, the indirect effect of regression coefficients is considered statistically significant if the confidence interval does not include zero.

Results

Table 1 presents the demographic characteristics of the participants. Of the 3,303 participants, 50% were male, and 50% were female. Regarding age, 36.5% of the total sample were aged 10, 41.9% were aged 11, 7.5% were aged 12, and 14.1% were aged above 12. In terms of religious beliefs, 58.7% of participants reported having none. With respect to education level, 50.1% were in Primary Five, and 49.9% were in Primary Six. The majority of participants (82%) were born in Hong Kong.

With regard to family background, 77.4% of participants' parents were married. In terms of household size, 29.2% of participants reported living with 1–3 family members (including themselves), 64.2% lived with 4–6 family members, and 6.6% lived with 7 or more family members. Concerning socio-economic status, 20% of participants had fathers whose highest education level was a diploma/professional certificate or above, while 22.5% had mothers with the same level of education. Finally, in terms of perceived family financial situation, 3.7% of participants rated it as much lower than average, 8.9% as below average, 56.2% as close to average, 26.4% as above average, and 4.8% as much higher than average.

Table 1
Socio-demographic Information of the Respondents (n = 3,303)

Socio-demographic Characteristic	Percentage
Gender	
Male	50
Female	50
Age	
10	36.5
11	41.9
12	7.5
Above 12	14.1
Grade	
Primary Five	50.1
Primary Six	49.9
Religion	
No Religion	58.7
Catholic	25.6
Christian	5.4
Buddhist	5.2
Islam	0.7
Taoist	1.0
Others	3.4
Born in Hong Kong	
Yes	82
No	18
Father's Education Level	
Primary or below	6.3
Junior Secondary	8.7
Senior Secondary 4–5	8.2
Senior Secondary 6–7	15.8

Socio-demographic Characteristic	Percentage
Diploma/Professional College	7.3
University Degree	5.8
Master's Degree	4.5
Doctoral Degree	2.4
Don't Know	41
Mother's Education Level	
Primary or below	7.2
Junior Secondary	8.6
Senior Secondary 4–5	8.5
Senior Secondary 6–7	15.5
Diploma/Professional College	8.8
University Degree	6.8
Master's Degree	4.9
Doctoral Degree	2.0
Don't Know	37.7
Parents' Marital Status	
Married	77.4
Cohabitated but not Married	1.3
Separated/Divorced	8.1
Father/Mother passed away	0.9
Others	2.1
Don't Know	10.2
Number of Family Members Living with (including the Student)	
1–3	29.2
4–6	64.2
7 or above	6.6
Perception of Family Financial Situation	
Much Lower than Average	3.7

Socio-demographic Characteristic	Percentage
Below Average	8.9
Close to Average	56.2
Above Average	26.4
Much Higher than Average	4.8

Table 2 presents the zero-order correlations among the main study variables. The results indicate that academic stress (the control variable) is significantly correlated with intolerance of uncertainty, life satisfaction, positive affect, and negative affect. Intolerance of uncertainty (the independent variable) is significantly associated with both positive and negative affect; however, it is not correlated with children's hope and life satisfaction. Children's hope (the mediating variable) is significantly correlated with life satisfaction, positive affect, and negative affect.

Table 2
Mean, Standard Deviations, and Correlations of the Study Variables

Variables	1	2	3	4	5	Mean	SD	Range
1. Academic Stress						3.91	1.10	1–6
2. Intolerance of Uncertainty	.61***					3.96	.85	1–6
3. Children's Hope	– .02	.04				4.32	.91	1–6
4. Life Satisfaction	– .13***	– .01	.47***			4.12	1.07	1–6
5. Positive Affect	– .13***	– .07***	.35***	.42***		3.31	.88	1–5
6. Negative Affect	.43***	.31***	– .18***	– .28***	– .05**	2.47	.89	1–5

Note: As several correlations are computed, to minimise the chances of making a Type I error, the Bonferroni approach (Bland & Altman, 1995) is adopted to determine the *p*-value.

** $p \leq .008$; *** $p \leq .001$.

Figure 1 and Table 3 report the results of the mediation analyses. Intolerance of uncertainty was designated as the independent variable. Children's hope was specified as the mediating variable, and three indicators of psychological well-being, namely life satisfaction, positive affect, and negative affect, served as outcome variables in three distinct single-mediator models. Figure 1 depicts the mediation model with standardised path coefficients.

Table 3 shows the total, direct, and indirect effects of the intolerance of uncertainty on life satisfaction, positive affect, and negative affect via children's hope.

Table 3
Total, Direct, and Indirect Effects of Intolerance of Uncertainty on Psychological Well-Being via Children's Hope

Outcome and Path	<i>B</i>	<i>SE</i>	95% CI		<i>p</i>
			LL	UL	
Life Satisfaction (<i>R</i> ² = .264)					
Total effect (c)	0.126	0.027	0.074	0.179	< .001
Intolerance of Uncertainty → Children’s Hope (a)	0.096	0.023	0.051	0.141	< .001
Children’s Hope → life satisfaction (b)	0.521	0.018	0.485	0.557	< .001
Direct effect (c')	0.076	0.024	0.029	0.123	0.001
Indirect effect (a×b)	0.05	0.015	0.022	0.08	—
Positive Affect (<i>R</i> ² = .153)					
Total effect (c)	0.022	0.023	-0.023	0.067	0.323
Intolerance of Uncertainty → Children’s Hope (a)	0.09	0.023	0.045	0.136	< .001
Children’s Hope → Positive Affect (b)	0.323	0.016	0.291	0.355	< .001
Direct effect (c')	-0.007	0.021	-0.049	0.035	0.751
Indirect effect (a×b)	0.029	0.009	0.012	0.047	—
Negative Affect (<i>R</i> ² = .230)					
Total effect (c)	0.097	0.021	0.056	0.138	< .001
Intolerance of Uncertainty → Children’s Hope (a)	0.088	0.023	0.043	0.133	< .001
Children’s Hope → Negative Affect (b)	-0.151	0.016	-0.181	-0.120	< .001
Direct effect (c')	0.11	0.02	0.07	0.15	< .001
Indirect effect (a×b)	-0.013	0.005	-0.023	-0.005	—
Note: CI: confidence interval; LL: lower limit; UL: upper limit					

Regarding the test of Hypothesis 1, it is surprising to find that intolerance of uncertainty exerts a direct positive effect on life satisfaction instead of the hypothesised negative effect ($B = 0.126$, $SE = 0.027$, 95% CI [0.074, 0.179], $p < .001$). In contrast, the total effect of the intolerance of uncertainty on positive affect did not reach statistical significance ($B = 0.022$, $SE = 0.023$, 95% CI [- 0.023, 0.067], $p = .323$), suggesting no direct association between the intolerance of uncertainty and positive affect. For negative affect, the

total effect was significant ($B = 0.097$, $SE = 0.021$, 95% CI [0.056, 0.138], $p < .001$), indicating that greater intolerance of uncertainty was associated with elevated negative affect, consistent with the a priori hypothesis. Collectively, Hypothesis 1 was partially supported for negative affect, but not for life satisfaction and positive affect.

Regarding Hypothesis 2, children's hope was significantly and positively associated with life satisfaction ($B = 0.521$, $SE = 0.018$, 95% CI [0.485, 0.557], $p < .001$) and positive affect ($B = 0.323$, $SE = 0.016$, 95% CI [0.291, 0.355], $p < .001$), and significantly and negatively associated with negative affect ($B = -0.151$, $SE = 0.016$, 95% CI [-0.181, -0.120], $p < .001$). This negative association aligns with Hypothesis 2, as negative affect is conceptualised as the inverse facet of psychological well-being. Hypothesis 2 was thus fully supported.

Regarding Hypothesis 3, the indirect effect of intolerance of uncertainty via children's hope was statistically significant and positive ($B = 0.050$, $SE = 0.015$, 95% CI [0.022, 0.080]). As the direct effect of the intolerance of uncertainty remained statistically significant ($B = 0.076$, $SE = 0.024$, 95% CI [0.029, 0.123], $p = .001$), this pattern is indicative of partial mediation (Hayes, 2022), whereby children's hope partially explained but did not fully account for the association between the intolerance of uncertainty and life satisfaction.

For positive affect, the corresponding indirect effect was also statistically significant and positive ($B = 0.029$, $SE = 0.009$, 95% CI [0.012, 0.047]). Given that neither the total effect nor the direct effect reached statistical significance, this pattern corresponds to indirect-only mediation (Hayes, 2022; Zhao et al., 2010), whereby the effect of the intolerance of uncertainty on positive affect operated entirely via children's hope with no detectable total or direct effect.

For negative affect, the indirect effect via children's hope was statistically significant and negative ($B = -0.013$, $SE = 0.005$, 95% CI [-0.023, -0.005]), whereas the direct effect of IU was positive and statistically significant ($B = 0.110$, $SE = 0.020$, 95% CI [0.070, 0.150], $p < .001$), a pattern that constitutes a statistical suppression effect (Hayes, 2022; MacKinnon et al., 2000). Substantively, intolerance of uncertainty exerted a direct positive effect on negative affect, while children's hope served as a protective buffer that partially offset this adverse association; specifically, higher levels of hope attenuated the otherwise positive association between intolerance of uncertainty and negative emotional experiences, and the persistence of a significant direct effect indicates that hope alone does not fully neutralise the detrimental impact of the intolerance of uncertainty on negative affect. Collectively, these findings lend partial support to Hypothesis 3.

To summarise, results from the study indicated that intolerance of uncertainty was associated with psychological well-being through distinct pathways. The relationship was positively mediated by children's hope for the positive dimensions of well-being, fully for positive affect and partially for life satisfaction, while for negative affect, children's hope served as a protective buffer that partially suppressed the direct detrimental association.

Discussion

This study examined the potential mediating role of hope in the association between intolerance of uncertainty (IU) and psychological well-being among Chinese children living in Hong Kong. Contrary to the conventional conceptualisation of IU as a maladaptive psychological characteristic associated with poorer adjustment among both adults and children (Cornacchio et al., 2018; Huntley et al., 2020; Osmanağaoğlu et al., 2021; Rifkin & Kendall, 2020), the present findings suggest a more nuanced relationship. After controlling for academic stress, IU was positively associated with life satisfaction and was indirectly associated with life satisfaction through children's hope. These unexpected findings may be understood in at least two complementary ways.

One possible explanation involves a suppression effect, whereby the variance in IU shared with academic stress obscures a positive association between the residual component of IU and life satisfaction. Once the variance attributable to academic stress is statistically removed, IU may capture aspects of a preference for predictability, planning, and preparation that can facilitate adjustment within Hong Kong's highly structured educational environment.

This interpretation needs to be considered within the sociocultural context in which Hong Kong children develop. They grow up in an environment characterised by intense academic competition, rapid social change, and uncertainty regarding future opportunities (Chyu & Chen, 2022; Shek et al., 2021). Within such a context, heightened sensitivity to uncertainty may, under some circumstances, encourage rather than undermine adaptive coping. Children who are uncomfortable with uncertainty may be more inclined to anticipate possible future events, set goals, prepare alternative strategies, seek support, and actively manage their future (Snyder et al., 1997). These future-oriented behaviours may, in turn, foster hope and contribute to greater life satisfaction. However, when uncertainty is experienced in conjunction with academic demands, it may become a source of stress that undermines well-being. Academic stress may therefore obscure the potentially adaptive association between the residual component of IU and life satisfaction. In this sense, uncertainty itself may not inevitably undermine well-being; rather, the ways in which children respond to and manage uncertainty may determine whether it becomes a source of distress or a catalyst for proactive adaptation.

A second, and complementary, explanation can be derived from Snyder's theory of hope (Snyder, 1995). According to this theory, hope comprises two interrelated components: agency thinking, referring to the perceived capacity and motivation to pursue desired goals, and pathways thinking, referring to the perceived ability to generate routes through which those goals can be achieved. From this perspective, children who experience greater discomfort with uncertainty may be particularly motivated to reduce ambiguity by anticipating possible outcomes, developing plans, considering alternative pathways, and preparing for future contingencies. These processes may strengthen both pathways and agency thinking, and consequently enhance hope. Thus, rather than viewing IU solely as a vulnerability, it may be possible to conceptualise it as a psychological characteristic that can initiate future-oriented cognitive processes under certain conditions.

This interpretation may also be situated within Chinese cultural understandings of adversity, change, and the coexistence of seemingly opposing experiences. Philosophical perspectives such as the *Yin–Yang* worldview emphasise the interconnectedness and dynamic coexistence of opposites, suggesting that well-being and adversity are not necessarily mutually exclusive but may be inherently intertwined (Lu, 2001). From this perspective, although individuals may find uncertainty difficult to tolerate, they may nevertheless learn to live with uncertainty and even experience life satisfaction in its midst (Author c). A similar pattern has been observed in research on meaning in life. Whereas studies conducted in Western societies have often found an inverse relationship between the presence of meaning and the search for meaning, these two dimensions have been found to be positively correlated among Chinese people, possibly because Chinese individuals are more inclined to harmonise seemingly oppositional aspects of meaning in life (Author b; Chan, 2014). This cultural tendency to accommodate and integrate apparent contradictions may help explain why IU and life satisfaction can coexist among Chinese children in Hong Kong. Rather than reflecting a simple linear relationship in which greater IU inevitably leads to poorer well-being, the present findings may instead reflect culturally embedded ways of understanding and responding to life's challenges, whereby discomfort with uncertainty and the capacity to experience satisfaction amid uncertainty can coexist.

The pattern of findings across the three indicators of psychological well-being further reinforces this more complex interpretation. After controlling for academic stress and demographic variables, the association between IU and positive affect was fully transmitted through children's hope. In contrast, IU was directly associated with elevated negative affect while simultaneously exerting an indirect association with reduced negative affect through enhanced hope. These findings suggest that IU may be linked to both vulnerability and adaptive processes, with the balance between these processes differing across dimensions of psychological well-being.

With respect to positive affect, no significant direct association was found between IU and positive affect. Instead, the association between IU and positive affect was fully mediated by children's hope. This pattern suggests that IU may contribute to positive emotional experiences not directly, but through its relationship with future-oriented psychological resources (Snyder et al., 1997; Valle et al., 2004). When children who are uncomfortable with uncertainty respond by anticipating the future, setting goals, developing alternative pathways, and preparing themselves for possible outcomes, their sensitivity to uncertainty may be channelled into hope. Hope, in turn, may facilitate positive emotional experiences.

The findings concerning negative affect present a related but distinct pattern. Consistent with previous research, IU was positively associated with negative affect, suggesting that children who experience greater discomfort with uncertainty may be more vulnerable to anxiety, worry, and other negative emotional experiences. At the same time, however, the present findings revealed a compensatory indirect pathway through which IU was associated with reduced negative affect via enhanced hope. This suggests that uncertainty sensitivity may not operate exclusively as a psychological vulnerability. For some children, discomfort with uncertainty may motivate future-oriented thinking, goal planning, and the generation of alternative pathways toward desired outcomes. These processes may strengthen hope,

which can subsequently buffer negative emotional experiences. Nevertheless, because the direct effect of IU on negative affect remained significant, hope appears to partially, rather than completely, offset the emotional burden associated with IU. In other words, hope may function as a protective psychological resource that counteracts, but does not fully eliminate, the distress associated with difficulty tolerating uncertainty.

Taken together, the findings provide preliminary support for a dual-process model of IU among Chinese children in Hong Kong. Rather than functioning as an exclusively maladaptive disposition, IU may operate through both vulnerability and adaptive pathways. On the vulnerability pathway, difficulty tolerating uncertainty may heighten negative emotional experiences, particularly when uncertainty is perceived as threatening or uncontrollable. On the adaptive pathway, however, the same sensitivity to uncertainty may motivate future-oriented cognitive processes, including goal planning, anticipation of possible outcomes, and pathway generation. When these processes are accompanied by sufficient psychological resources, they may strengthen hope and, in turn, promote life satisfaction and positive affect while mitigating some of the negative emotional consequences of IU. IU may therefore represent a double-edged psychological characteristic: it can amplify distress when uncertainty is experienced as threatening, but it may also facilitate hope and psychological adjustment when it stimulates proactive, goal-directed responses.

The suggestion of a dual-process model of IU among Hong Kong children can be further illuminated by considering the existential meaning of hope. As Svendsen (2024) argues, hope is necessarily oriented towards something uncertain, while at the same time depending on the existence of a genuine possibility of its realisation. To hope, therefore, is to move towards a desired goal while recognising that its achievement is not guaranteed. If a goal could be attained easily and without internal or external obstacles, there would be little need for hope. Hope thus entails an awareness that the future remains uncertain and that desired outcomes may not be realised, regardless of one's efforts. Yet, precisely because the future is uncertain, hope provides direction and a sense of agency by giving the future a degree of structure. From this perspective, hope may help explain the seemingly paradoxical relationship between IU and psychological well-being observed in the present study. Although children cannot eliminate all uncertainty or guarantee desired outcomes, hope may enable them to respond to uncertainty by envisioning possible futures, identifying pathways towards valued goals, and maintaining motivation to move forward. In this sense, hope may represent the psychological mechanism through which the potentially maladaptive and adaptive aspects of IU coexist: IU makes uncertainty salient and potentially distressing, while hope provides direction and a sense of agency within that uncertainty. The findings therefore suggest that the relationship between IU and children's psychological well-being may be better understood not as a simple continuum from tolerance to distress, but as a dynamic interplay between vulnerability to uncertainty and the capacity to transform uncertainty into purposeful, future-oriented action.

Limitations of the Study and Future Research Directions

Although the present study addresses part of the knowledge gap identified earlier, several limitations should be acknowledged, and these limitations provide important directions for future research. First, although the study recruited a relatively large sample of 3,303 children from 31 primary schools across different districts in Hong Kong, the generalisability of the findings should be interpreted with caution because the sample was not randomly selected and may not be fully representative of the broader population of children in Hong Kong. Second, the reliance on self-reported survey data may have introduced response biases, including social desirability bias. Third, the cross-sectional research design limits the extent to which causal relationships among the study variables can be established. In particular, although the mediation analyses provide evidence of indirect associations that are theoretically consistent with the proposed model, the temporal ordering of intolerance of uncertainty, hope, and psychological well-being cannot be confirmed.

Despite these limitations, the present study provides a useful starting point for further investigation into the meaning, manifestations, and psychosocial correlates of intolerance of uncertainty among children across different sociocultural contexts, particularly in East Asian societies. Future research could examine whether the dual-process pattern identified in the present study can be replicated in other cultural settings and explore the cultural and contextual factors that may shape how children experience and respond to uncertainty. Researchers could also investigate additional mediators and moderators that may explain, amplify, or buffer the differential effects of intolerance of uncertainty on various dimensions of children's psychological well-being. Such research would contribute to a more nuanced understanding of intolerance of uncertainty as a potentially multifaceted psychological characteristic that may operate through both vulnerability and adaptive pathways.

Implications for Social Work Practice and Life Education

The findings of this study have important implications for youth social workers, educators, and other practitioners working with children and young people. In particular, they call for a shift from a predominantly problem-focused approach, which seeks primarily to reduce stress and alleviate psychological distress, towards a more balanced and hope-oriented framework for promoting children's psychological well-being.

The findings suggest that intolerance of uncertainty should not be understood solely as a vulnerability to be reduced. Rather, practitioners should recognise that, under appropriate conditions, children's sensitivity to uncertainty may also be channelled into future-oriented thinking, goal setting, and proactive coping. The central task of child social work, therefore, is not simply to help children eliminate uncertainty, which is impossible, but to equip them with the psychological, relational, and meaning-making resources needed to navigate uncertainty constructively.

First, the findings highlight the importance of fostering hope as a core component of child services and interventions. As a future-oriented cognitive and motivational process (Snyder, 1995), hope enables children to establish meaningful goals, identify alternative pathways towards those goals, and sustain motivation when confronted with obstacles. Hope-oriented programmes can therefore play an important

role in helping children respond adaptively to academic stress and the uncertainties associated with their future. Interventions that incorporate goal setting, problem-solving, pathway generation, and the development of agency may strengthen children's capacity to envision positive futures and take purposeful action towards them. More importantly, such interventions may help transform uncertainty from a source of helplessness into a stimulus for constructive engagement with the future.

This emphasis on hope also points to the need to broaden conventional approaches to coping. Traditional stress-coping frameworks have often focused on problem-focused and emotion-focused coping (Buckner et al., 2003). While these approaches remain important, the present findings suggest that children's well-being may also depend on how they interpret and make meaning of uncertainty and adversity. The preliminary support for a dual-process model of intolerance of uncertainty indicates that the same sensitivity to uncertainty may operate through different pathways. On the vulnerability pathway, difficulty tolerating uncertainty may intensify negative emotional experiences, particularly when uncertainty is perceived as threatening, uncontrollable, or overwhelming. On the adaptive pathway, however, sensitivity to uncertainty may motivate children to anticipate possible outcomes, plan for the future, generate alternative pathways, and actively pursue valued goals. Child services should therefore seek not only to reduce children's distress in the face of uncertainty but also to strengthen their capacity to respond to uncertainty in ways that promote hope and purposeful action.

In this regard, meaning-focused coping may provide an important complement to conventional problem- and emotion-focused approaches. Meaning-focused coping involves interpreting stressful or uncertain experiences in ways that preserve or promote a sense of meaning, personal growth, and life purpose (Author b, c; Park & Folkman, 1997). Such an approach is particularly relevant to the present findings because it recognises that uncertainty cannot always be solved or eliminated. Instead, children can be supported to develop ways of understanding uncertainty that enable them to identify possibilities, maintain hope, and continue to move towards personally meaningful goals. This perspective shifts the focus of intervention from simply asking how children can cope with uncertainty to also asking how they can find meaning and direction within uncertainty.

Life education and life-skills development programmes represent one practical avenue through which these capacities can be cultivated (Author d, e; Yuen et al., 2021). Such programmes aim to equip young people with the personal and social competencies needed to navigate everyday challenges and develop positive life trajectories (Yuen et al., 2021). Nevertheless, in contemporary practice, life education is often framed primarily as a response to personal inadequacies or social problems. Although such a problem-oriented approach has important practical value, an exclusive focus on preventing negative outcomes may overlook the deeper existential concerns that shape children's and adolescents' development (Rumianowska, 2020). A more meaning-focused approach to life education should therefore place greater emphasis on the exploration of life meaning and purpose (Author d; Yuen et al., 2021). From this perspective, life is not a fixed sequence of achievements but a dynamic process of interpreting experiences and responding to uncertainty. The purpose of life education is thus not merely to prepare children and young people to avoid problems, but to help them develop the capacity to live

meaningfully and hopefully amid life challenges (Jacobsen, 2008). Such an orientation is consistent with the present findings, which suggest that hope may provide children with a sense of direction and agency precisely because the future remains uncertain.

This meaning-oriented perspective has thus important implications for formal education. Schools in Hong Kong should consider incorporating life education and meaning-oriented curricula that provide students with opportunities to reflect on their life experiences, values, goals, and broader purposes in life. Meaning exploration can take place at multiple levels, including interpretations of life experiences, sources of meaning, personal goals, and broader life purposes (Schnell, 2009). Through reflective dialogue, experiential learning, and project-based activities, students can be encouraged to connect academic learning with real-life social and personal concerns. Such approaches may provide an important counterbalance to the narrow emphasis on examination performance that characterises many educational experiences in Hong Kong. Rather than viewing academic achievement as the primary or sole indicator of a successful future, meaning-oriented education can help children recognise multiple possible pathways through life and develop hope even when their preferred outcomes are uncertain.

The development of hope and meaning should not, however, be confined to the classroom. Nonformal learning contexts also provide valuable spaces in which children and young people can encounter uncertainty, explore possibilities, and develop a broader understanding of themselves and the world. Experiential learning, volunteer service, and community engagement programmes can enable children and youth to connect their personal experiences with wider social realities and to discover alternative sources of meaning (Author f; Nagy & Székely, 2010). Through participation in these activities, they may experience themselves as capable of contributing to others and influencing their communities, thereby strengthening their sense of agency and hope. Such experiences may be particularly important for children whose educational environments are dominated by academic competition, as they provide alternative contexts in which they can experience competence, connection, purpose, and meaningful participation.

At the same time, efforts to cultivate hope and meaning among children should extend beyond individual interventions and educational settings to include the family environment. In Hong Kong and other Chinese cultural contexts, discussions of parenting frequently emphasise the importance of parental involvement in children's development (Author g). However, relatively little attention has been paid to how parents themselves understand child development and make meaning of their parenting experiences. Parents are not merely providers of support; they are also individuals who directly experience the uncertainties, pressures, and challenges associated with accompanying their children through academic demands and increasingly precarious life trajectories. Understanding how parents make meaning of their own parenting journeys may therefore provide important insights into how they can better support their children in developing hope (Author g).

Accordingly, parent education and family support should place greater emphasis on the factors that shape parents' meaning-making about parenthood, child development, and their own expectations for

their children's futures, as well as on potential discrepancies between parents' and children's perceptions and experiences (Author i). An existential approach to parent support may be particularly valuable in this regard. Previous research suggests that existentially oriented parent interventions can strengthen parent-child relational connectedness and contribute to improvements in parenting practices (Author h). Such an approach recognises the importance of helping parents reflect on their own existential concerns, psychological needs, and emotional struggles, and to understand how these experiences shape their relationships and interactions with their children. By developing greater self-awareness and expanding their narratives of parenthood, parents may become better able to respond to their children's experiences of stress and uncertainty with warmth, emotional nurturance, and constructive interaction (Author g). In this way, supporting parents to make meaning of their own experiences may indirectly create a relational environment in which children are better able to develop hope and navigate uncertainty.

Taken together, these implications suggest that promoting children's well-being in the context of academic stress and uncertainty requires a multi-level and integrated approach. At the individual level, practitioners can cultivate hope by strengthening children's agency, goal setting, and capacity to generate pathways towards desired futures. At the educational and community levels, life education, experiential learning, and meaningful participation can provide opportunities for children and young people to explore purpose, identity, and alternative possibilities beyond academic achievement. At the family level, supporting parents to reflect on their own experiences and strengthen relational connectedness can create a more nurturing environment in which children can develop hope. Across these levels, the central objective should be to move beyond a narrow focus on eliminating stress or uncertainty and instead strengthen the internal, relational, and contextual resources that enable children to develop hope and act purposefully in the face of uncertainty. In this sense, hope-oriented child and youth services should not seek to promise children certainty about the future; rather, they should help children develop the capacity to face an uncertain future with direction, agency, and meaning (Svendsen, 2024).

Declarations

Author Contribution

The first author and second author were responsible for the research design and data collection. All three authors contributed significantly to the writing, critical review, and final preparation of this manuscript. All authors read and approved the final manuscript.

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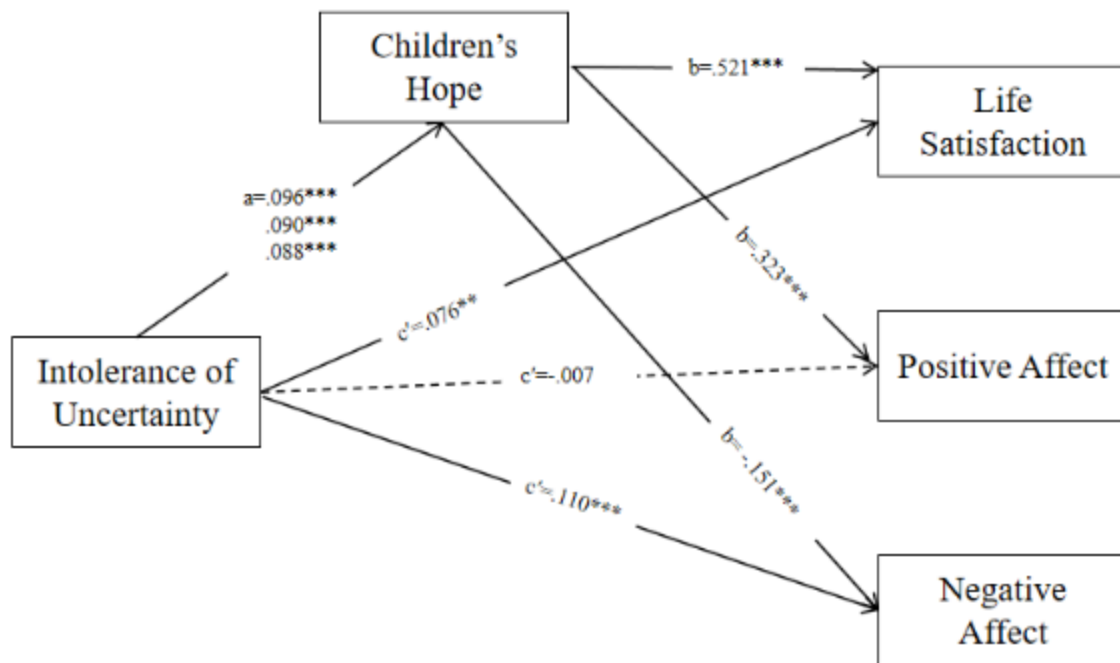
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Figures



Note. $*** p < .001$, $**p < .01$. Standardized coefficients (B) shown. Covariates: Academic Stress, Sociodemographic Variables.

Figure 1

Mediation Model with Standardised Path Coefficients