Gender differences in humour styles of young adolescents: Empathy as a mediator

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A B S T R A C T
Humour has its positive and negative features; negative humour leads to tension between two people. Moreover, there are gender differences in the use of humour. Previous research has demonstrated that males tend to prefer unfriendly humour. Aggressive behaviours are predictable by the level of empathy and may mediate the use of humour by males and females. To address this issue, the present study recruited 431 adolescents and used the Interpersonal Reactivity Inventory and the Humor Styles Questionnaire. We found that males prefer to use aggressive and self-enhancing humour, whereas females have more empathy; the perspective-taking and empathic concern are positively correlated to positive humour styles but are negatively correlated to negative humour styles. The perspective-taking and empathic concern serve to mediate the relation between gender and humour styles. In particular, empathic concern is the mediator of gender and aggressive humour, and perspective-taking is the mediator of gender and the other three humour styles. Aggressive humour is highly related to one's ability to receive the suffering of others, whereas using the three humour styles is related to whether one can perceive or identify with another’s viewpoint. The present study helps us to understand why males prefer unfriendly humour.

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1. Introduction
Humour can soften the relationship between two people and is helpful in establishing and maintaining social contact (Zand, Spreen, and Lavalle, 1999). Humour brings happiness; however, hostile humour occasionally presents a tense situation (Martin, Publik-Doris, Larsen, Gray, and Weir, 2003). Research has shown that in social contact, males tend more often to use aggressive humour compared to females (Yip & Martin, 2006) and that there is a gender difference in the use of humour. In addition to the gender factor, will there be other reasons that might influence a person’s humour style? Among the many candidates, the use of empathy can effectively predict the aggressive behaviour of people (Gini, Albiero, Benelli, and Altke, 2007); individuals with more empathy have demonstrated to be less inclined to attack others. Hence, we would understand more regarding the individual difference of humour use if empathy is a mediator of humour styles and genders. To address this issue, the present study investigates the mediating role of empathy in the humour process and the humour styles between males and females.

2. Gender difference in the use of humour
Humour plays an important role in social contact because it brings individuals closer together (Kuchner, 1991; Zand et al., 1999), it makes us feel happy, and it makes us avoid argument. People with a sense of humour tend to cope with conflict and embarrassment in social situations. On the one hand, a sense of humour is a positive characteristic that brings people together, e.g., a witty response makes you laugh; on the other hand, a sense of humour is sometimes aggressive, e.g., it is so mean that it irritates others (Martin et al., 2003).

In summary, humour has various functions (Martin, 2003), and the methods for evaluating humour are, thus, multiple (Thorson and Powell, 1993). In previous research, the tool for measuring a sense of humour could not discriminate the humorous expression toward oneself or toward others and could not differentiate between the friendly and unfriendly humour as well (Martin, 2007; Martin and Lefcourt, 1984; Svebak, 1974; Thorson and Powell, 1993). In 2003, Martin et al. first proposed the four humour styles, which classified humour styles along the dimensions of “toward oneself or toward others” and “kind-hearted or malicious,” so that we have the styles of affiliative humour, self-enhancing humour, aggressive humour, and self-defeating humour. The former two are positive styles, and the latter two are negative humour styles. Subsequently, they developed the “humor styles questionnaire” to measure the potentially kind-hearted humour and the potentially malicious humour styles. This questionnaire aims to
understand one’s humour styles in ordinary life, especially the coping of social contact and life pressure.

Using the humour styles questionnaire (Martin et al., 2003), we understood how different the humour styles are between genders. Using 1195 undergraduates as a sample, the results showed that males have a stronger tendency than females to use all types of humour styles. Yip and Martin (2006) also recruited an undergraduate sample but found that males only preferred an aggressive humour style; Kazarian and Martin (2006) demonstrated that male adults usually used aggressive humour and self-defeating humour. In Asia, using the Chinese sample, Chan et al. (2009) found that males preferred unfriendly humour styles but females preferred affiliative humour style to improve interpersonal relationships. However, Martin et al. thought additional discussion is warranted to determine whether the gender difference in humour styles was a result of nature or education.

3. Likelihood of empathy in a mediating role

Empathy is defined as acquiring knowledge and sensitivity regarding how others feel because of understanding their situation (Eisenberg, 2000). Using the factor analysis, Davis (1983) defined empathy using four dimensions of interpersonal interaction tendency in cognition and disposition as follows: (1) perspective taking, the tendency of truly taking or comprehending others’ psychological perspectives; (2) fantasy, how I would feel if I played the role in movies, fiction, and games; (3) empathic concern, the tendency of providing care to others when they are in trouble; and (4) personal distress, having temporal anxiety or discomfort in nervous interpersonal situations. Davis developed the Interpersonal Reactivity Index (IRI) accordingly, and the majority of the following research continued and developed based on his definition, especially the dimensions of perspective taking and empathic concern. For instance, Eisenberg claimed that empathy was the co-responding of cognition and emotion processes; the cognition process enabled individuals to identify the differences of the emotional status of oneself and others and the emotion process referred to the empathy and the feeling of suffering. Decety and Jackson (2006) indicated that the emotion process was the ability to share feelings with others, whereas the cognition process was the abilities of self-awareness and perspective-taking.

With respect to gender difference, females generally show empathy more than males, from the age of preschool on (Christov-Moore et al., 2014). With the expectation of gender role, showing concern and empathy is an important characteristic for females to fit the social role; females are expected to show more empathic behaviours than males in any situation. This statement is generally supported by the data of many empirical studies. In all types of self-report questionnaires, females are reported to demonstrate a greater tendency to be empathic than males in cognition and emotion aspects (Chaplin and Aldao, 2013; Rose and Rudolph, 2006).

Regarding the initial research on empathy and humour, Hampes (2001) found that humour and empathy were positively correlated by concluding from the results of The Empathy Concern subscale of the Empathy Questionnaire, the Coping Humor Scale (CHS), the Multidimensional Sense of Humor Scale, and the Situational Humor Response Questionnaire (SHRQ). However, Hampes did not believe that humour might have a negative aspect in the beginning. Subsequently, he used the Empathy Questionnaire and Humour Styles Questionnaire in continuous studies. Hampes discovered that affiliative humour style and empathic concern had a significantly positive correlation, that self-enhancing humour style and perspective taking were positively relevant, that aggressive humour style, perspective taking, and empathic concern were negatively correlated; however, self-defeating humour style was not related to empathy (Hampes, 2010). In particular, regarding the cognition aspect or emotion aspect, empathy and aggressive humour style had a negative correlation. This finding was consistent with the claim by Mayberry and Espelage (2007). With regard to emotion aspect, empathy makes people stop hurting others because they know how others feel. With regard to the cognition aspect, empathy allows individuals to observe from another person’s viewpoint in social contact to decrease the bias by hostile attribution in the social information process.

To conclude, empathy is vital in interpersonal interacting. Moreover, research also has shown that empathy is strongly related to gender and humour styles. Hence, empathy is a potential mediator to the gender difference in the use of humour.

4. The present study

Previous studies have demonstrated gender difference in humour styles using (Chan et al., 2009; Kazarian and Martin, 2006; Martin et al., 2003; Yip & Martin, 2006). To discuss the potential factors for gender difference because of nature or education, the empirical support is still lacking. If we can identify the influential factor of humour styles and genders, the psychological process might be clear to us. Empathy is one key index to psychological health (Hobson, 2007; Lee, 2007); empathy, gender, and humour styles are also obviously relevant (Christov-Moore et al., 2014; Hampes, 2010). In previous research on humour styles, the focus was for the most part on other psychological traits, such as self-esteem, subjective well-being, and bullying (Dyck and Holtzman, 2013; Schermer et al., 2015; Stieger, Formann, and Burger, 2011); however, the studies regarding the specific process were few. One study focussed on empathy as a mediator to different psychological traits (Lee, 2009). Hence, the present study aims to investigate the mediator of empathy between gender and humour styles and hope that we could learn more concerning gender difference in the use of humour.

Concluding from the aforementioned reviews, we already know that males prefer the aggressive humour style in every type of sample. For the remaining three humour styles, the findings were inconsistent. Moreover, the gender difference in empathy is across ages; females generally exhibit more empathy than males in the cognition and emotion aspects. Empathy and humour styles are significantly relevant; the empathic concern and perspective taking are positively correlated to the affiliative humour style and self-enhancing humour style but are negatively correlated to the aggressive humour style, which shows that the aggressive humour style tends to be predictable by its cognition and emotion aspects. Hence, the present study compares the humour styles and the cognition and emotion aspects of empathy by genders and subsequently identifies the correlation of empathy and humour styles for the next stage. We investigate the mediating role of empathy in the relationship of gender and humour styles using the hierarchy regression analysis, Sobel Test, and the Bootstrapping Method; furthermore we assume that empathy mediates the tendency of using aggressive humour style between different genders. (See Fig. 1.)

5. Method

5.1. Participants

A total of 431 junior high school students in Taiwan (of whom 195 were male) were recruited to participate in the study. The students ranged in age between 13 and 14 years old; the average age in the sample was 13.32 (SD = 0.47) years. The participants were invited by their teachers, and each of them received a set of stationery after completing the experiment. All the participants agreed to proceed the research after well informed and completing the informed consent form.

5.2. Materials and procedure

The Humor Styles Questionnaire (Chan, Chen, Cho, and Martin, 2011) contains the following four styles: affiliative humour, self-enhancing humour, aggressive humour, and self-defeating humour. Every style is measured using 8 items. The total questionnaire comprises 32 items. The participant rates each item using a 7-point scale;
higher scores refer to the stronger tendency of that humour style. Internal reliabilities range from 0.73 to 0.88; taking the personality, behaviours of attack, and self-esteem as the criteria, the correlation coefficients range from 0.25 to 0.54 and the criterion validities are fine. 

The Interpersonal Reactivity Inventory was developed by Lin and Cheng (2010), who translated two sub-inventories into a Chinese edition, the empathic concern and the perspective-taking of the inventory by Davis (1983) and Mayberry and Espelage (2007). Each sub-scale is composed of 6 items using a 5-point scale. The Interpersonal Reactivity Inventory consists of 12 items. The participant who obtains a higher score would spontaneously think in another’s viewpoint or would have the ability to receive another’s feelings and experiences. The internal consistence coefficients range from 0.85 to 0.89. Regarding the constructs validity, according to the results of the factor analysis, the factor loadings of each item range from 0.63 to 0.81, and the total variance explained is 55.57%, and the validity of the inventory is fine.

The experimental design was counterbalanced; 50% of the participants initially completed the Humor Styles Questionnaire and subsequently the Interpersonal Reactivity Inventory, whereas the remaining 50% of the participants completed the Interpersonal Reactivity Inventory and subsequently the Humor Styles Questionnaire.

6. Results

6.1. Gender differences analyses

Table 1 lists the mean and SD values in the Humor Styles Questionnaire as well as those in Interpersonal Activity Inventory for junior high school students categorized by male and female. The gender differences are shown in humour styles and empathy. First, for the results of humour styles, the tendencies of using self-enhancing humour and aggressive humour are significantly higher in males than in females (t > 2.50, p < 0.05, d > 0.24); junior high school boys tend to use the humour styles for promoting self-belief or attacking others. The tendencies of perspective-taking and empathic concern are obviously higher in females than in males (t > −3.26, p < 0.01, d > −0.31); junior high school girls tend to acquire the affective responses and experiences of others from the cognition and emotion aspects.

6.2. Relationship between humour styles and empathy

The correlations of humour styles and empathy are significant (Table 2). In particular, positive humour styles (affiliative humour and self-enhancing humour) are positively relevant to empathy (r ≈ 0.19, p < 0.01); aggressive humour style and empathy are negatively correlated (r ≈ −0.37, p < 0.01); the individual who has more empathy tends to use positive humour styles but the person who has less empathy tends to use the aggressive humour style. Moreover, the self-defeating humour style is positively correlated to the perspective-taking of empathy (r ≈ 0.11, p = 0.03) but is not related to the empathic concern (r = 0.05, p = 0.34), which refers to the tendency of using self-defeating humour that is related to the cognition aspect of empathy but not to the emotion aspect. In summary, the tendency of positive humour style or negative humour style is bonded to the level of empathy.

6.3. Mediation analyses

We investigated the mediator roles of perspective-taking and empathic concern in the relationship of gender and humour styles using the hierarchy regression analysis. After considering the mediating effect, the results showed that gender is less predictive to the aggressive humour style but that empathy mediates the relation of gender and
aggressive humour. However, the correlations of gender to affiliative humour, self-enhancing humour, and self-defeating humour are higher after considering empathy as the mediator. Hence, empathy might play the role of suppressor in the relationship between gender and humour styles.

We also investigated the indirect effects of gender on the humour styles through the perspective-taking and the empathic concern using the methods of the Sobel Test (Sobel, 1982) and the Bootstrapping Method (Preacher and Hayes, 2008).

The results of the Sobel Test indicate that empathic concern mediated the relation of gender and the aggressive humour style \((Z = 2.64)\) and that perspective-taking mediated the relation of affiliative humour, self-enhancing humour, and self-defeating humour \((Z < -1.82)\).

Regarding the analysis using the Bootstrapping Method, it resamples and measures the mediating effect by interval estimation. We generated the sample data by random sampling from the raw data of 431 participants, and calculated the bootstrap coefficient and the estimate of indirect effect with this sample data. The procedure repeats 500 times; hence, we obtain 5000 bootstrap coefficients and the mean of indirect effect. Table 3 lists the 95% confidence interval \((CI)\) of the indirect effect of gender on humour styles through empathy. The results show that the mediating effect of gender on aggressive humour is significant through the empathic concern of empathy \((95\% CI = 0.03–0.21)\); also, the mediating effect of gender on affiliative humour, self-enhancing humour, and self-defeating humour is significant through empathic concern; the 95% CI does not include 0.

The results of the two methods are agreeable, and the mediator roles of the two dimensions of empathy are identified. The emotion aspect, empathic concern, mediates the relation of gender and the aggressive humour; the cognition aspect, perspective-taking, mediates the corresponding relation of gender to the affiliative humour, self-enhancing humour, and self-defeating humour.

### 7. Discussion

The gender difference was found in the humour styles in interpersonal relationships (Chan et al., 2009; Kazarian and Martin, 2006; Martin et al., 2003; Yip & Martin, 2006). Our study first investigated the mediator role of empathy in the relationship of gender and humour styles and found the potential factors to gender difference using humour styles. The results support portions of the hypotheses. Males prefer aggressive humour, which is consistent with the results in previous findings (Yip & Martin, 2006); females exhibit empathy, which is also consistent with the results of previous research (Christov-Moore et al., 2014). Moreover, our results also support the concept that empathy and humour styles are apparently linked (Hampe, 2010); empathy is positively correlated to affiliative humour, self-enhancing humour, and self-defeating humour but is negatively correlated to aggressive humour. Finally, the results of the hierarchy regression analysis reveal that the empathic concern partly mediates the relationship of gender and aggressive humour; the perspective-taking is, however, a suppressor and, in part, mediates the corresponding relation of gender to affiliative humour, self-enhancing humour, and self-defeating humour. Our finding suggests that empathy plays an influential role in the relationship of gender and humour styles and also in the mediating effects of cognition and emotion aspects of empathy in the use of humour styles by genders.

The results support our hypotheses that empathy is the mediator of using aggressive humour by genders, and the results are consistent with previous findings that aggressive behaviours could be predicted by empathy (Gini et al., 2007; Miller and Eisenberg, 1988). An individual with more empathy was less likely to attack others. Aggressive humour style is to attack others using humour to defeat others with expressions of mocking, scoffing, and teasing (Martin et al., 2003). Many studies have indicated that males frequently use the aggressive humour style (Kazarian and Martin, 2006; Martin et al., 2003; Yip & Martin, 2006) and that they tend to be less empathic (Chaplin and Aldao, 2013; Rose and Rudolph, 2006). According to the results of mediation analyses, we know that males prefer aggressive humour, in part, because males lack empathy, especially in the emotion aspect. Males often interact by mocking or ridiculing others but seldom by acquiring others’ pain from the aspect of empathic concern; they consequently tend to inflict pain on others (Mayberry and Espelage, 2007).

We learned that empathy mediates the relations of gender to affiliative humour, self-enhancing humour, and self-defeating humour. After incorporating empathy into the model, the prediction of genders to these three humour styles increases; i.e., empathy is a suppressor to the relation of gender and affiliative humour, self-enhancing humour, and self-defeating humour (Conger, 1974; Kline, 2005), particularly, the perspective-taking, which is the cognition aspect. In previous research, however, there were no consistent findings to the gender difference on using these humour styles except the aggressive humour style (Kazarian and Martin, 2006; Martin et al., 2003; Yip & Martin, 2006), which suggests other distributing variables not yet found. The correlations of empathy and affiliative humour, self-enhancing humour, and self-defeating humour styles are lower than those of empathy and the aggressive humour style (Hampe, 2010). Although the direct effect of gender is not significant to affiliative humour and self-defeating humour after taking empathy as a mediator, the present study found that the prediction will increase after considering the effect of perspective-taking. To conclude, the tendency to use affiliative humour, self-enhancing humour, and self-defeating humour by males and females, and the ability of perspective-taking is important for individuals in an interpersonal relationship, although empathy is not highly related to these three humour styles.

Furthermore, we found the cognition and emotion aspects of empathy are positively correlated to affiliative humour and self-enhancing humour, but negatively correlated to aggressive humour. Perspective-taking and self-defeating humour are not well correlated. People who are capable of perspective-taking and empathic concern frequently use humour to establish interpersonal harmony or decrease pressure, and they are less likely to use aggressive humour (Martin et al., 2003). In particular, self-defeating humour, a type of malicious humour, is positively related to the ability of perspective-taking. An individual with enhanced capability of thinking from another’s viewpoint is also capable of self-ridiculing. The potential reason might be the culture. Confucianism is dominant in Chinese culture; self-defeat might appear as an expression of being humble (Hu, Huang, Chen, Wang, and Lai, 2010), which therefore makes the perspective-taking and self-defeating humour styles relevant in the Chinese sample.

The results in the present study differ from the results obtained by Hampe (2010). In his study, the sample consisted of 103 American adults; affiliative humour and empathic concern were positively correlated, and self-enhancing humour and perspective-taking were also

<table>
<thead>
<tr>
<th>Humour styles</th>
<th>Affiliative</th>
<th>Self-enhancing</th>
<th>Aggressive</th>
<th>Self-defeating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empathy</td>
<td>−0.15 to −0.04</td>
<td>−0.17 to −0.04</td>
<td>0.05 to 0.22</td>
<td>−0.10 to −0.01</td>
</tr>
<tr>
<td>Empathic concern</td>
<td>−0.06 to 0.03</td>
<td>−0.10 to 0.03</td>
<td>0.04 to 0.21</td>
<td>0.00 to 0.12</td>
</tr>
<tr>
<td>Perspective-taking</td>
<td>−0.16 to −0.03</td>
<td>−0.17 to −0.01</td>
<td>−0.04 to 0.11</td>
<td>−0.19 to −0.03</td>
</tr>
</tbody>
</table>
positively relevant; aggressive humour and perspective-taking and empathic concern were negatively related, but self-defeating humour and empathy were not significantly correlated. In our study, the sample consisted of 431 Chinese junior high school students. Using the correlations of the Interpersonal Reactivity Inventory and Humor Styles Questionnaire, two dimensions of empathy were significantly relevant to all of the humour styles. The likely reasons for the inconsistence between the results of the two studies might be attributable to the cultures, ages, or even the sample size. Additional research is warranted to clarify whether nature or education is influential with regard to traits of empathy and preference of humour styles.

There are several restrictions on implementing the research. First, the purposive sampling constrains the inference of results. Second, the self-report questionnaire is limited in having the entire picture regarding the traits of empathy and use of humour styles. It suggests combining the methods of teacher evaluation, peer evaluation, field observation, and individual interview to obtain richer information. Finally, the random sampling is also recommended so that the results could be re-verified and inferred.

In conclusion, our study found empathic concern that, in part, replaced the relation of gender and aggressive humour for junior high school students; perspective-taking is confounding to the use of affiliative humour, self-enhancing humour, and self-defeating humour by genders. By considering empathic concern, the prediction ability of gender to the use of humour increases, which also shows the functional roles of cognition and emotion aspects of empathy in the gender difference of humour styles and discloses the internal process of humour styles and interpersonal relationship. Finally, our study results suggest the improvement of decreasing aggressive humour style, which will encourage empathy in junior high school students. Compassion and care shown toward others who experience unfortunate situations would be helpful in reducing the tendency to use aggressive humour.

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