

**Theses of Doctoral (PhD) Dissertation**

# **The effects of compensation on forgiveness**

Gábor Papp

Supervisor: Judit Kovács, Ph.D



**UNIVERSITY OF DEBRECEN**

**Doctoral School of Human Sciences**

Debrecen, 2014.

## **The aim of the dissertation, definition of the subject**

The aim of the dissertation was the investigation of the predictors of interpersonal forgiveness; specifically we focused on compensation. Forgiveness is a complex interpersonal prosocial coping mechanism (Witvliet et al., 2008), with important emotional, cognitive and behavioral aspects. Forgiveness reduces the distress and negative feelings, thoughts and motives after a transgression (Fincham, 2009, Worthington & Scherer, 2004), and, if the relationship of the involved parties allow it (Worthington, 2005), forgiveness facilitates positive feelings, thoughts and motives. These positives could manifest in prosocial behaviors and they could help to maintain the relationship.

Forgiveness has many positive effects. According to Worthington and Scherer (2004) people experience an unpleasant, stressful state after a transgression, but this can be reduced by forgiveness, which affects the health of the injured party. Lawler et al. (2005) showed that the forgiveness of a transgression is associated with various measures of health: physical symptoms, medications used, sleep quality, fatigue, and somatic complaints. According to their proposed model, forgiveness reduces negative feelings (like anger depression) and stress, and through these effects forgiveness causes positive changes. Karremans, Van Lange, Ouwerkerk and Kluwer (2003) showed that forgiveness not only promotes physiological health, but mental health as well.

Besides mental and physiological health, forgiveness could have favorable effects on interpersonal level. Forgiving a transgression improved cooperation and willingness to sacrifice, however lack of forgiveness resulted in fewer pro-relationship behaviors (Karremans & Van Lange, 2004). According to Karremans, Van Lange and Holland (2005) forgiveness could even facilitate the prosocial behaviors of the offended party beyond the relationship with the offender.

Many factors could influence forgiving. These factors could be situational or dispositional (Fehr, Gelfand & Nag, 2010). Situational factors include apology, harm severity or the relationship between the involved parties, while dispositional factors include personality traits like dispositional forgiveness or agreeableness.

Our aim was to study the effects of compensation on forgiveness. Compensation is a situational predictor of forgiveness, and its purpose is to ease the negative consequences of the transgression. It is not clear, how compensation influences forgiveness (Fischbacher &

Utikal, 2013). Several studies show that compensation payments can increase forgiveness (e.g. Bottom, Gibson, Daniels & Murningham, 2002), however, other studies show that compensation has no significant effect on forgiveness. It is even possible, that compensation draw the offended party's attention to the transgression which was not detected before, just like apology did in a study by Risen and Gilovich (2007). We examined the effects of compensation on forgiveness in three studies, with different methods.

### **Study I.**

In our first study we examined the effects of compensation on forgiveness after a mild transgression in a distant relationship, depending on the extent of the compensation, and who (the institution or the transgressor) made the decision about it. In this study we collected data using questionnaires and laboratory experiments. The situation we used in this study is parallel to those mild workplace transgressions that could have serious destructive effects if they escalate.

According to our first hypothesis, in the case of a multi-component transgression a multi-component (or full) compensation is more effective than a one-component (or partial) compensation, which is more effective than the absence of compensation (**H1**). We formulated this hypothesis based on the studies which investigated the connection between compensation and forgiveness (Bottom et al., 2002; Scher & Darley, 1997; Schmitt et al., 2004).

Our second hypothesis regards the agent (transgressor or institution) who decides on compensation: We assume that it promotes forgiveness more, if the transgressor is the decision maker (**H2**). We based this expectation upon those studies which showed that compensation from the transgressor is superior in promoting forgiveness (Desmet et al., 2010; Ristovski & Wertheim, 2005). However, we expect this effect to be stronger in the case of presence of compensation compared to the case of absence of compensation (**H3**).

### **Methods**

In our first study we used two different data collecting methods. First, we conducted a scenario-based questionnaire study. Second, we realized the situation in the first study in laboratory environment. In the questionnaire study the sample consisted of 323 participants, 229 women and 92 men (2 participants did not respond to the question regarding the gender). The age of the participants ranged between 19 and 35 years, 22.38 on average. In the laboratory study the sample consisted of 117 participants (61 women and 56 men) who

applied for the experiment through a student work organization. The age of the participants ranged between 17 and 28 years, 21.6 on average. The participants all got a fixed amount of 1200 Ft, and some of them got some compensatory money as the part of the procedure (470 Ft on average).

The situation was the following: the participants had the opportunity to join a game where they could win some money, but in the last minute a randomly selected team leader decided that they will be excluded from the game. After this either this team leader or the rules of the game decides what kind of compensation will the participants receive (full compensation – partial compensation – no compensation). We measured their emotional state, then their level of forgiveness. We measured forgiveness by a modified version of the „Forgiveness Scale”, invented and validated by Rye and his colleagues (2001). This scale has two factors: Absence of Negative and Presence of Positive. These factors measure the absence of negative, and the presence of positive feelings, thoughts and behavioral tendencies. After the participants replied the Forgiveness Scale they took part in a dictator game: they got a sum of money to decide on how to share it with another participant who was eventually the former „leader”.

## ***Results***

According to our first hypothesis, in the case of a multi-component transgression a multi-component (or full) compensation is more effective than a one-component (or partial) compensation, which is more effective than the absence of compensation. Results showed that compensation had a significant effect on the Absence of Negative factor ( $F_{\text{COMPENSATION}[2, 419]} = 6.524$ ;  $p = 0.002$ ). The level of forgiveness was the lowest when the participants received no compensation ( $M = 4.04$ ;  $SD = 1.41$ ), but in the case of partial ( $M = 4.21$ ;  $SD = 1.20$ ) or full compensation ( $M = 4.23$ ;  $SD = 1.33$ ) the level of forgiveness does not differ significantly.

Our second hypothesis regards the agent (transgressor or institution) who decides on compensation: We assume that it promotes forgiveness more, if the transgressor is the decision maker, we expect this effect to be stronger in the case of presence of compensation compared to the case of absence of compensation. In respect of the second hypothesis we report a main effect of the identity of decision maker ( $F_{\text{DECISION MAKER}} [1, 419] = 6.01$ ;  $p = 0.015$ ), however institutionally ordered compensation alleviated negative feelings towards the violator more efficiently ( $M = 4.29$ ;  $SD = 1.09$ ), than the one decided personally by the violator ( $M = 4.02$ ;  $SD = 1.08$ ). We observed this effect in the case of the Absence of

Negative factor as well. ( $F_{\text{DECISION MAKER}[1,419]} = 5.554$ ;  $p = 0.02$ ). Institutionally ordered compensation resulted in higher level of forgiveness ( $M = 5.52$ ;  $SD = 1.30$ ), than compensation ordered by the violator ( $M = 5.23$ ;  $SD = 1.29$ ). The decision maker had a marginally significant effect on the Presence of Positive factor as well ( $F_{\text{DECISION MAKER}[1,419]} = 3.013$ ;  $p = 0.083$ ). Positives were present more when compensation was ordered by the rules ( $M = 5.23$ ;  $SD = 1.30$ ), than when it was ordered by the team leader ( $M = 5.09$ ;  $SD = 1.29$ ).

## **Study II.**

In our second questionnaire study besides compensation, we took into account the effects of the relationship between the involved parties. Our main question was whether the relationship closeness influences the effects of compensation. In other words, does compensation work better in a closer or a more distant relationship? Furthermore, we examined the effects of the need for mentalisation, as a personality trait on forgiveness.

We hypothesized that compensation facilitates forgiveness (**H1**). According to our second hypothesis, relationship closeness plays an important role; in a close relationship, it is easier to forgive (**H2**). Our third hypothesis is that the need for mentalisation correlates positively with situational forgiveness (**H3**).

## **Methods**

102 participants filled out our questionnaire for our second study, 80 women and 22 men. The age of the participants ranged between 17 and 56, with 24.11 on average. Participants read one of four possible scenarios, in which we manipulated the closeness of the relationship (close and distant) and the presence or absence of compensation.

For the measurement of the need for mentalisation we used the Need for Mentalisation Scale by Ágnes Bernáth and Judit Kovács (2013). This scale consists of 15 items and 3 factors: a need for reading others' mental states; a need for untroubled interactions and an attitude towards reading others.

For the measurement of situational forgiveness we used the modified version of the Forgiveness Scale by Rye et al (2001), and we run the analyses on its factors separately.

## **Results**

Our first hypothesis was that compensation facilitates forgiveness. The analysis showed that compensation resulted in fewer negatives ( $F_{\text{COMPENSATION}}[1,94] = 5.405$ ;  $p = 0.022$ , i.e. the scores on the Absence of Negative were higher:  $M = 6.11$ ;  $SD = 0.66$ ), then when there were no compensation ( $M = 5.12$ ;  $SD = 1.11$ ). We found the same effect in the case of the Presence of Positive factor as well ( $F_{\text{COMPENSATION}}[1,94] = 4.713$ ;  $p = 0.032$ ), the lack of compensation resulted lower scores on this factor ( $M = 4.25$ ;  $SD = 1.03$ ), than the presence of compensation ( $M = 5.28$ ;  $SD = 0.92$ ).

According to our second hypothesis forgiveness is more likely in a close than in a distant relationship. This hypothesis was only partially supported. We found a marginally significant interactive effect of compensation and relationship closeness on the Absence of Negative factor ( $F_{\text{COMPENSATION} \times \text{CLOSENESS}}[1,94] = 3.670$ ;  $p = 0.058$ ). In a close relationship the lack of compensation did not result in lesser forgiveness. Relationship closeness had a marginally significant effect on Presence of Positive as well, ( $F_{\text{CLOSENESS}}[1,94] = 3.559$ ;  $p = 0.062$ ), in a close relationship positives are on a higher level ( $M = 4.88$ ;  $SD = 1.07$ ), then in a distant relationship ( $M = 4.64$ ;  $SD = 1.11$ ).

We expected a similar effect from the need for mentalisation. This hypothesis was only partially supported. The need for mentalisation and compensation had a marginally significant interactive effect on the Absence of Negative ( $F_{\text{COMPENSATION} \times \text{MENTALISATION}}[1,94] = 2.805$ ;  $p = 0.097$ ). The higher need for mentalisation reduced the negatives when compensation was not present. The need for mentalisation had a main effect on the Presence of Positive ( $F_{\text{MENTALISATION}}[1,94] = 6.802$ ;  $p = 0.011$ ), a higher need for mentalisation resulted in higher level of positive thoughts and feelings.

## **Study III.**

In our third study we examined the effects of compensation in a case of a severe transgression. In this study we asked the participants to recall a transgression. Our main goal was to examine how does compensation influence forgiveness and the relationship after a serious harm. We wanted to explore how is compensation linked to other, situational predictors of forgiveness. We used structural equation modeling for that purpose.

Our first question was whether there is a difference between the effects of compensation and apology on forgiveness, because these two behaviors differ on a conceptual level, and experimental studies suggest that a difference is possible (De Cremer, 2010;

Haesevoets, Folmer, De Cremer & Van Hiel, 2013). We expect that apology facilitates positive emotions, thoughts and motives, while compensation reduces the negatives.

We expect the relationship closeness to influence apology, compensation, forgiveness and relationship closeness after the transgression. Furthermore, it influences the perceived severity of the transgression.

According to Struthers, Eaton, Santelli, Uchiyama and Shirvani (2008), the perceived intentionality of the harm negatively correlates with apology and compensation. We expected intentionality to inhibit forgiveness, and it is associated with a decrease in relationship closeness after the transgression.

It is hard to forgive a transgression which has serious negative consequences (Fincham, Jackson & Beach 2005, Fehr et al., 2010). Accordingly, we expect a negative correlation between harm severity and forgiveness.

## ***Methods***

We asked the participants to recall and write down a transgression as accurately as they can. Specifically, we asked them to write a transgression which was very hard to forgive *when it happened*. This was important, because if we would not make this condition, it is probable that no transgression that has been written would be forgiven. Then the participants responded to questions regarding their gender, age, and the time when the transgression happened. After this we measured various possible predictors of forgiveness and the participants current relationship to the transgressor. We analysed the relationship between these predictors with structural equation modeling (SEM).

The sample consisted of 111 participants, 83 women and 27 men, one participant did not respond to the question regarding the gender. The age of the participants ranged between 18 and 51 years, 28.01 years on average.

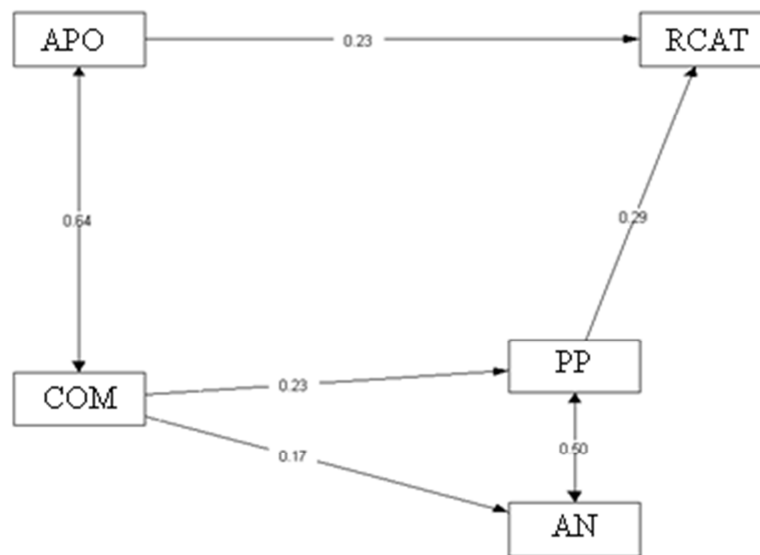
We measured relationship closeness before and after the transgression, for that we used a modified version of the Subjective Closeness Index by Berschied, Snyder and Omoto (1989). We also measured intentionality, the negative consequences of the transgression, apology, and compensation. We used the Forgiveness Scale by Rye et al. (2001) to measure forgiveness.

## Results

The fit indices of our final model showed a good fit ( $\chi^2/df = 1.012$ , CFI = 1.000, TLI = 0.999, RMSEA = 0.010, SRMR = 0.030). The starting point of our model is the relationship closeness before the transgression, which has a significant effect on all the other predictor variables ( $p < 0.01$ ). It influences harm severity, apology, compensation, forgiveness and the relationship closeness after the transgression.

We found an important difference between the effect of apology and compensation. Apology only affected the relationship closeness after the transgression ( $p < 0.01$ ), however it did not have any effect on forgiveness. In contrast, compensation only affected the two factors of forgiveness ( $p < 0.01$ ), but did not affect directly the relationship closeness after the transgression.

The Absence of Negative factor did not show any connection with the relationship closeness after the transgression, but the Presence of Positive did.



**Figure 1. The effects of apology and compensation on forgiveness**

**Note:** APO = apology, COM = compensation, AN = absence of negative, PP = presence of positive, RCAT = relationship closeness after the transgression

## Summary

The goal of the dissertation was to examine the effect of compensation as a restorative strategy. In our first study we examined how can compensation facilitate forgiveness after a



not too severe transgression, in a distant relationship. Our second study was scenario-based as well, and we manipulated the relationship closeness. In our third study we asked the participants to recall a transgression that was not easy to forgive. Our results show that compensation plays an important role in forgiveness and relationship maintenance.

Our results showed that compensation could play an important role in forgiving a transgression. Our studies showed that the decision maker could influence the effectiveness of the compensation. Specifically, institutional settlement of a minor negative affair resulted in more forgiving than personal settlement, at least in a case when the relationship is not close and the transgression is mild. In a close relationship the absence of compensation can be tolerated, but compensation could facilitate forgiveness in a close relationship as well. However, compensation cannot replace apology in restoring the relationship, both have their unique role.

These results could be important in dealing with everyday harmful situations. For example, it can have positive effects, if there are preliminary plans for compensating the offended party in an organization, because it can inhibit a conflict from becoming escalated. However, compensation in itself is not enough when the involved parties are close, but with an appropriate apology it can restore the relationship.

## References

- Abeler, J., Calaki, J., Andree, K., & Basek, C. (2010). The power of apology. *Economics Letters*, 107(2), 233-235.
- Bernáth, Á., & Kovács, J. (2013). A mentalizációs igény és a machiavelliánus nézetekkel való egyetértés. *Magyar Pszichológiai Szemle*, 68(4), 671-685.
- Berscheid, E., Snyder, M., & Omoto, A. M. (1989). The relationship closeness inventory: Assessing the closeness of interpersonal relationships. *Journal of Personality and Social Psychology*, 792-807.
- Bottom, W. P., Gibson, K., Daniels, S. E., & Murningham, J. K. (2002). When talk is not cheap: Substantive penance and expressions of intent in rebuilding cooperation. *Organization Science*, 13(5), 497-513.
- De Cremer, D. (2010). To pay or to apologize? On the psychology of dealing with unfair offers in a dictator game. *Journal of Economic Psychology*, 843-848.

- Desmet, P. T., De Cremer, D., & Van Dijk, E. (2010). On the psychology of financial compensations to restore fairness transgressions: When intentions determine value. *Journal of Business Ethics*, 95, 105–115.
- Fehr, R., Gelfand, M. J., & Nag, M. (2010). The road to forgiveness: A meta-analytic synthesis of its situational and dispositional correlates. *Psychological Bulletin*, 894–914.
- Fincham, F. D., Jackson, H., & Beach, S. R. (2005). Transgression severity and forgiveness: Different moderators for objective and subjective severity. *Journal of Social and Clinical Psychology*, 24(6), 860–875.
- Fincham, F. D. (2009). Forgiveness: Integral to close relationships and inimical to justice? *Virginia Journal of Social Policy and the Law*, 16, 357–384.
- Fischbacher, U., & Utikal, V. (2013). On the acceptance of apologies. *Games and Economic Behavior*, 82, 592–608.
- Haesevoets, T., Folmer, C. R., De Cremer, D., & Van Hiel, A. (2013). Money isn't all that matters: The use of financial compensation and apologies to preserve relationships in the aftermath of distributive harm. *Journal of Economic Psychology*, 35, 95–107.
- Karremans, J. C., & Van Lange, P. A. (2004). Back to caring after being hurt: the role of forgiveness. *European Journal of Social Psychology*, 207–227.
- Karremans, J. C., Van Lange, P. A., & Holland, R. W. (2005). Forgiveness and its associations with prosocial thinking, feeling, and doing beyond the relationship with the offender. *Personality and Social Psychology Bulletin*, 1315–1326.
- Karremans, J. C., Van Lange, P. A., Ouwerkerk, J. W., & Kluwer, E. (2003). When forgiving enhances psychological well-being: The role of interpersonal commitment. *Journal of Personality and Social Psychology*, 84(5), 1011–1026.
- Lawler, K. A., Younger, J. W., Piferi, R. L., Jobe, R. L., Edmondson, K. A., & Jones, W. H. (2005). The unique effects of forgiveness on health: An exploration of pathways. *Journal of Behavioral Medicine*, 157–167.

- Risen, J. L., & Gilovich, T. (2007). Target and observer differences in the acceptance of questionable apologies. *Journal of Personality and Social Psychology*, 92(3), 418-433.
- Ristovski, A., & Wertheim, E. H. (2005). Investigation of compensation source, trait empathy, satisfaction with outcome and forgiveness in the criminal context. *Australian Psychologist*, 40(1), 63-69.
- Rye, M. S., Loiacono, D. M., Folck, C. D., Olszewski, B. T., Heim, T. A., & Madia, B. P. (2001). Evaluation of the psychometric properties of two forgiveness scales. *Current Psychology: Developmental, Learning, Personality, Social*, 20(3), 260-277.
- Scher, S. J., & Darley, J. M. (1997). How effective are the things people say to apologize? Effects of the realization of the apology speech act. *Journal of Psycholinguistic Research*, 26(1), 127-140.
- Schmitt, M., Gollwitzer, M., Nikolai, F., & Montada, L. (2004). Effects of objective and subjective account components on forgiving. *The Journal of Social Psychology*, 144(5), 465-485.
- Struthers, C. W., Eaton, J., Santelli, A. G., Uchiyama, M., & Shirvani, N. (2008). The effects of attributions of intent and apology on forgiveness: When saying sorry may not help the story. *Journal of Experimental Social Psychology*, 983-992.
- Witvliet, C. V., Worthington, E. L., Root, L. M., Sato, A. F., Ludwig, T. E., & Exline, J. J. (2008). Retributive justice, restorative justice, and forgiveness: An experimental psychophysiology analysis. *Journal of Experimental Social Psychology*, 10-25.
- Worthington, E. L. (2005). More questions about forgiveness: Research agenda for 2005–2015. In E. L. Worthington, *Handbook of forgiveness* (old.: 557–574). New York: Brunner-Routledge.
- Worthington, E. L., & Scherer, M. (2004). Forgiveness is an emotion-focused that can reduce health risks and promote health resilience: theory, review, and hypotheses. *Psychology & Health*, 385-405.



UNIVERSITY OF DEBRECEN  
UNIVERSITY AND NATIONAL LIBRARY  
PUBLICATIONS



Register number: DEENKÉTK/204/2014.  
Item number:  
Subject: Ph.D. List of Publications

Candidate: Gábor Papp  
Neptun ID: DA47WX  
Doctoral School: Doctoral School of Human Sciences  
Mmt ID: 10038517

**List of publications related to the dissertation**

Hungarian book chapter(s) (2)

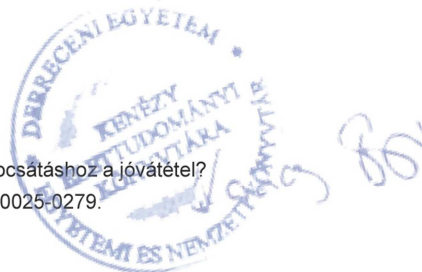
1. **Papp G.**, Bernáth Á., Tóth E.: A mentalizációra irányuló igény és a jóvátétel hatása a megbocsátásra közeli és távoli kapcsolatban.  
In: Pszichológiai kutatások: Debreceni Egyetem Pszichológiai Doktori Program. Szerk.: Münnich Ákos, Debreceni Egyetemi Kiadó, Debrecen, 99-111, 2014. ISBN: 9789633184158
2. **Papp G.**, Kovács J.: A súlyos sérelmet követő megbocsátás prediktorai.  
In: Tavaszi Szél = Spring Wind. Szerk.: Keresztes Gábor, Doktoranduszok Országos Szövetsége, Budapest, 570-577, 2013. ISBN: 9789638956026

Foreign language international book chapter(s) (1)

3. **Papp G.**, Kovács J., Pántya J.: When does compensation lead to forgiving?: An experimental study about how the agent and extent of compensation influences forgiving.  
In: Interdisciplinary Research in Humanities. Ed.: Gergely Angyalosi, Ákos Münnich, Gabriella Pusztai, Constantine the Philosopher University in Nitra, Nitra, 375- 394, 2013. ISBN: 978805580284

Hungarian scientific article(s) in Hungarian journal(s) (1)

4. **Papp G.**, Kovács J., Pántya J., Kiss N.: Mikor vezet megbocsátáshoz a jóvátétel?  
*Magyar Pszichol. Szle.* 68 (2), 277-300, 2013. ISSN: 0025-0279.  
DOI: <http://dx.doi.org/10.1556/MPSzle.68.2013.2.6>





---

List of other publications

Foreign language international book chapter(s) (1)

5. Kovács, C., Kovács, J., Pántya, J., **Papp, G.**: Chat with a Mach - Machiavellian effectiveness in computer-mediated interactions.  
In: Interdisciplinary Research in Humanities. Ed.: Gergely Angyalosi, Ákos Münnich, Gabriella Pusztai, Constantine the Philosopher University in Nitra, Nitra, 361-374, 2013. ISBN: 9788055802848

Hungarian scientific article(s) in Hungarian journal(s) (4)

6. Nistor M., **Papp G.**, Martos T., Molnár P.: Az Érzelmi Leválás Kérdőív Magyar Változatának (DSI-H) pszichometriai jellemzői.  
*Magyar Pszichológiai Szemle.* 68 (3), 533-554, 2013. ISSN: 0025-0279.  
DOI: <http://dx.doi.org/10.1556/MPSzle.68.2013.3.08>
7. Nistor M., **Papp G.**, Martos T., Molnár P.: A Személyes Autoritás a Családi Rendszerben Kérdőív magyar változatának (PAFSQ-H) pszichometriai jellemzői.  
*Mentálhigiéné és Pszichoszomatika.* 14 (3), 259-280, 2013. ISSN: 1419-8126.  
DOI: <http://dx.doi.org/10.1556/Mental.14.2013.3.4>
8. Pántya J., Dallos A., **Papp G.**, Kovács J.: A nemi alapú elutasítás iránti érzékenység és a férfiakkal szembeni ellenséges hiedelmek hatása az elutasítást követő helyzetértelmezésre és megbocsátási szándékra.  
*Alk. Pszichol.* 14 (2), 21-42, 2012. ISSN: 1419-872X.
9. Kovács J., Bernáth Á., Pántya J., **Papp G.**: Az együttműködő személy figyelmessége és eredményessége által keltett benyomások a megfigyelőben: Tesz-e különbséget a társas értékorientáció kétféle szemüvege?  
*Pszichológia.* 31 (2), 107-123, 2011. ISSN: 0230-0508.  
DOI: <http://dx.doi.org/10.1556/Pszicho.31.2011.2.2>





UNIVERSITY OF DEBRECEN  
UNIVERSITY AND NATIONAL LIBRARY  
PUBLICATIONS



---

Foreign language scientific article(s) in international journal(s) (1)

10. Almássy, Z., Pék, G., **Papp, G.**, Greenglass, E.R.: The Psychometric Properties of the Hungarian Version of the Proactive Coping Inventory: Reliability, Construct Validity and Factor Structure. *Int. J. Psychol. Psychol. Ther.* 14 (1), 115-124, 2014. ISSN: 1577-7057.

Hungarian conference proceeding(s) (1)

11. Merza K., Harmatta J., **Papp G.**, Kuritárné Szabó I.: Gyermekkori traumatizáció, disszociáció és önsértő viselkedés borderline személyiségzavarban.  
In: A határtalan elme korlátai : absztrakt kötet. A Magyar Pszichiátriai Társaság XVIII. Vándorgyűlése, Győr. jan 23-26. Szerk.: szerk. Afangide B. et al. -, Magyar Pszichiátriai Társaság, Győr, 75, 2013.

Total IF of journals (all publications): 0

Total IF of journals (publications related to the dissertation): 0

The Candidate's publication data submitted to the iDEa Tudóstér have been validated by DEENK on the basis of Web of Science, Scopus and Journal Citation Report (Impact Factor) databases.

21 August, 2014

